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English for Exams

20

ACADEMIC
READINGS

IELTS

ACADEMIC READINGS
FOR EXAM PRACTICE

Dr. Kiranpreet Kaur Makkar

VOL. 2

IELTS

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FOR EXAM PRACTICE

Volume – 2

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PREFACE

Dear Students

First of all, thank you for showing your immense love for the Volume 1 of Academic Reading Book. We have received a lot of positive feedback on how these readings helped students attain their desired band scores in the IELTS exam and some of you have requested for additional readings to practice. So, we have come up with the 2nd Volume of Academic Reading Book and this book also contains 20 academic readings for exam practice. Again, these readings are comparable to the level that students get in the actual exam and topics of the readings are also similar to the ones asked in the exam. Like before, the beginning of the book includes strategies on how to approach the IELTS reading exam along with tips for individual question types.

Hope you enjoy solving the readings in the book.

Kiranpreet Kaur Makkar
Indroop Singh Makkar

General Introduction

The IELTS Academic Reading Test lasts for 60 minutes and includes 3 Passages. There are total 40 questions and each correct answer carries one mark. The questions are of different types and designed to test a wide range of skills.

Timing



Reading Test Duration
60 Minutes

40
Questions

- The IELTS Reading test takes 60 minutes.
- You will not be allowed any extra time to transfer your answers, so you should write them directly on your answer sheet.
- Managing your time during the test is very important as you are not told when to start or finish a section.

Three Sections



You will read approximately
2150-2750 words

- There are 3 passages in the IELTS Academic text which are taken from books, journals, magazines and newspapers.
- The difficulty level increases as you progress from Passage 1 to Passage 3.
- The tests are on academic topics of general interest and written for a non-specialist audience.
- The tests might include some graphics such as diagrams, graphs or illustrations, which you will be expected to understand.
- The texts range from being descriptive and factual to discursive and analytical.
 - For example, a text describing how ants gather food would be a descriptive text, whereas, a text discussing an art piece would come under analytical range.

Question Types



Different question formats

13 types

You will be asked a variety of questions from the following different types.

- Multiple choice
- True/False/Not Given (Identifying Information or Facts)
- Yes/No/Not Given (Identifying a writer's claim)
- Matching information
- Matching paragraph headings
- Matching sentence endings
- Sentence completion
- Table completion
- Diagram completion
- Flowchart completion
- Summary Completion
- Short Answer Questions
- Choosing a Title

Exam Purpose



**ASSESS READING
SKILLS**

The purpose of the exam is to assess a wide range of reading skills, including

- Reading for the main ideas in the passage.
- Reading for gist. (gist – the substance or general meaning of a text)
- Reading for the details provided in the passage.
- To understand the implied meaning.
- Recognizing the opinion, attitude of the writer.
- Following the development of an argument.

Marking



**Each question carries
1 Mark**

- Each correct question receives one mark
- The scores out of 40 are then converted to the IELTS 9-Band Scale.
- The Band Scales for Academic Reading and General Reading are different.
 - In order to score 7 Bands in General Training Reading Exam, you need 34 questions correct out of total 40 questions.

Score	Bands
0	0
4	2.5
5	2.5
6	3
7	3
8	3.5
9	3.5
10	4
11	4
12	4
13	4.5
14	4.5
15	5
16	5
17	5
18	5
19	5.5
20	5.5
21	5.5

Score	Bands
22	5.5
23	6
24	6
25	6
26	6
27	6.5
28	6.5
29	6.5
30	7
31	7
32	7
33	7.5
34	7.5
35	8
36	8
37	8.5
38	8.5
39	9
40	9

How to prepare for the IELTS Reading Test

IELTS reading module is basically comprehension. There are three passages, each about 900 words, and you have to answer 40 questions in 60 minutes. So, you have one and a half minute per question. Students who have a fairly good hold over the language, devise their own strategies. Unfortunately, their strategies work well only for them or for those who are at the same level as they are. The strategies I am putting here are for those who fail to reach band 6 in reading. Of course, they may be useful for everyone.

1. Time management is the first thing that has to be learnt with practice. Leave any question that is troubling you. Remember, you can do 17 wrong and still get a 6. Go on to the next question. But, put any symbol on the question you are leaving out. Otherwise you will be writing all answers in the wrong sequence. This can prove catastrophic later on.
2. Read the question nicely. See clearly what has been asked. Do you have to write only ONE word answer, or can you write up to THREE?
3. The key to IELTS reading is to learn to read better, not faster. This means that you understand what you are reading, and that you notice straight away when you reach the part of the passage that contains the answer. If you read too quickly, you'll probably miss the answer and waste time going back to look for it.
Note: If you really are a very slow reader (when reading English), this is probably because your overall level of English is low. In other words, you're at beginner to intermediate level at the moment, and you have to think about every word as you read. This is a normal stage in language learning, and you shouldn't rush to read more quickly.
4. DO NOT have a handy dictionary while doing reading. Always imagine the meaning of the word. This is what you will ultimately have to do in the actual exam. So, practicing this way will help in the long run. Do the whole reading in this way. Then check your answers.
5. The next step is to make a list of all the words in the 3 reading passages that were new to you. Check their meanings in the dictionary and write them down next to the word in your list.
6. Now come back to your answers. Supposing you have 20 answers wrong. Don't worry and start working on each wrong answer. You know the correct answer now. So, try to figure out why you went wrong and why the correct answer is correct. If you do it on your own, it will be much better. Undoubtedly, having someone to help you will be time saving, but doing it on your own will be more fruitful eventually. If you are working on 20 wrong

answers, it will take you another hour or so. After spending so much time, there will be still some odd 4-5 questions you may be unsure about and may need help.

7. Initially, each reading may take you 3-4 hours or even more. You do the reading in one hour; check the answers in 10 minutes; make a list of the new words you have learnt in 10 minutes; search for their meanings in the dictionary in about 30 minutes; go back to your wrong answers and figure out why and where you went wrong. All this may seem very arduous to you, but slowly, you will have to spend less and less time on each reading. As your vocabulary improves, you will be able to do better and better.
8. Familiarize yourself with the type of questions that come. You don't have to do anything special for them. Once you have done 4-5 readings, you will come across all the types of questions that come.
9. Work on your weak points and make your strong points your forte. I mean keep working on them too.
10. My final tip is the 3 P's. Practice, practice and practice. The Cambridge University Press books are the best for practice. You have a chance to see similar passages in the actual exam.

Tips & Strategies for Various Question Types

1. Matching Headings Questions

In these types of questions, a list of headings is given and you have to match it with the paragraph or section.

Read all the headings first and try to understand them nicely (I usually tell my students to translate them in their language). This saves time. For example, if you have to match 6 headings, then you have 9 minutes in all. I have tried this technique many times in my classroom. It will take up to a maximum of 2 minutes. Then, read the first sentence and last sentence of the paragraph. About 70% of the times you will come across something, which will match with any heading you have already read. In this way, I have noticed that most students are able to complete the set of questions within the given time. You may have to read a few paragraphs completely. Even then time can be managed.

2. True False Not Given / Yes No Not Given Questions

In these types of questions, you have to decide if the information or writer's opinion in the question statements can be found in the passage.

Yes / true - the same information is found in the passage

No / false - the opposite information is found in the passage

Not given - the information is not found in the passage

- Paraphrase the statements before trying to locate the answers.
- The answers will usually come in order in the passage.
- Students mostly get confused between False and Not Given option. Here, it is important to understand that False/No is the opposite or contradicting statement in the passage whereas Not Given could be no information or partial information in the passage. To avoid this confusion you can make an opposite statement of the question and check whether it is provided in the passage or not.

3. Matching Paragraph Information Questions

These types of questions are similar to paragraph headings, but you have to scan the paragraph for the specific information. Paraphrase the information in the question. Then look for the key words. Try to find them in the paragraphs. The paragraph may be repeated. Not all paragraphs may be used.

4. Summary Completion Question

You have to complete a summary by filling in the gaps using words from the passage or words given in a box. You should identify the type of word needed for each gap (noun/verb/adjective etc). This will help you be grammatically correct when you complete the summary. Locate the information in the passage in order to choose the right word. If you choose words from the passage, check how many words can be used for each answer. Answers usually come in order.

5. Sentence Completion Questions

In these types of questions, you have to complete sentences by filling in the gap with words from the passage. Skills are similar to those needed for the summary completion.

6. Multiple Choice Questions

You have to choose the correct answer to a question or the correct ending to a sentence from usually 3 or 4 possible options.

You should paraphrase the information in the question and options. Then locate the precise information in the passage. Answers usually come in order

7. Choosing a Title

This is a global choice question, which means that the answer will be from the overall gist of the passage. It is usually in MCQ form. This is usually the last question of the passage. I usually advise my students not to waste too much time on this question. They have already answered about 12 questions before that. So, they should choose one answer from the list of 4 given based on what they think could be correct based on the earlier answers they have located. They could at the most look at the first and the last para.

8. Categorisation Questions

In these types of questions, you have to decide which category the information belongs to from a list.

9. Matching Sentence Endings

You have to complete sentences by matching the start of the sentence with the correct ending given in a list. It is important to understand the information. Read through the sentences and then read through the possible endings. Try to paraphrase the questions and endings. Choose the best ending to match the information in the passage. The completed sentence must be grammatically correct. Answers are usually letters (A-G), so

read instructions carefully to check

10. Table Completion

You have to complete the table using the correct word from the passage. Read the column headings in the table and then identify the type of word needed for each part of the table. Answers are often located in a specific part of the passage. Check how many words you can use for the answer.

11. Flow Chart Completion Questions

You have to complete the flow chart using the correct words from the passage. The strategies are just like filling in the blanks.

12. Diagram Completion Questions

In this you have to label a diagram. Answers are usually near each other, maybe in one paragraph or two.

13. Short Answer Questions

You have to answer questions regarding details in the passage. Check how many words you can use for the answers. Answers usually come in order

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EXAM READING 21

READING PASSAGE 1

Questions 1-7

Reading Passage 1 has seven paragraphs, A-G. Choose the most suitable heading for paragraphs A-G from the list below. Write the appropriate number, i-x, in boxes 1-7 on your answer sheet.

List of Headings

- | | |
|------|---|
| i | General points of agreements and disagreements of researchers |
| ii | How much children really know about food |
| iii | Action is needed |
| iv | Advertising effects of the "Big Four" |
| v | Connection of advertising and children's weight problems |
| vi | Evidence that advertising affects what children buy to eat |
| vii | How parents influence children's eating habits |
| viii | Advertising's focus on unhealthy options |
| ix | Children often buy what they want |
| x | Underestimating the effects advertising has on children |

1. Paragraph A
2. Paragraph B
3. Paragraph C
4. Paragraph D
5. Paragraph E
6. Paragraph F
7. Paragraph G

EFFECTS OF FOOD PROMOTION ON CHILDREN

This review was commissioned by the Food Standards Agency to examine the current research evidence on:

- *the extent and nature of food promotion to children*
- *the effect, if any, that this promotion has on their food knowledge, preferences and behaviour.*

A. Children's food promotion is dominated by television advertising, and the great majority of this promotes the so-called 'Big Four' of pre-sugared breakfast cereals, soft-drinks, confectionary and savoury snacks. In the last ten years advertising for fast food outlets has rapidly increased. There is some evidence that the dominance of television has recently begun to wane. The importance of strong, global branding reinforces a need for multi-faceted communications combining television with merchandising, 'tie-ins' and point of sale activity. The advertised diet contrasts sharply with that recommended by public health advisors, and themes of fun and fantasy or taste, rather than health and nutrition, are used to promote it to children. Meanwhile, the recommended diet gets little promotional support.

- B. There is plenty of evidence that children notice and enjoy food promotion. However, establishing whether this actually influences them is a complex problem. The review tackled it by looking at studies that had examined possible effects on what children know about food, their food preferences, their actual food behaviour (both buying and eating), and their health outcomes (eg. obesity or cholesterol levels). The majority of studies examined food advertising, but a few examined other forms of food promotion. In terms of nutritional knowledge, food advertising seems to have little influence on children's general perceptions of what constitutes a healthy diet, but, in certain contexts, it does have an effect on more specific types of nutritional knowledge. For example, seeing soft drink and cereal adverts reduced primary aged children's ability to determine correctly whether or not certain products contained real fruit.
- C. The review also found evidence that food promotion influences children's food preferences and their purchase behaviour. A study of primary school children, for instance, found that exposure to advertising influenced which foods they claimed to like; and another showed that labelling and signage on a vending machine had an effect on what was bought by secondary school pupils. A number of studies have also shown that food advertising can influence what children eat. One, for example, showed that advertising influenced a primary class's choice of daily snack at playtime.
- D. The next step, of trying to establish whether or not a link exists between food promotion and diet or obesity, is extremely difficult as it requires research to be done in real world settings. A number of studies have attempted this by using amount of television viewing as a proxy for exposure to television advertising. They have established a clear link between television viewing and diet, obesity, and cholesterol levels. It is impossible to say, however, whether this effect is caused by the advertising, the sedentary nature of television viewing or snacking that might take place whilst viewing. One study resolved this problem by taking a detailed diary of children's viewing habits. This showed that the more food adverts they saw, the more snacks and calories they consumed.
- E. Thus, the literature does suggest food promotion is influencing children's diet in a number of ways. This does not amount to proof; as noted above with this kind of research, incontrovertible proof simply isn't attainable. Nor do all studies point to this conclusion; several have not found an effect. In addition, very few studies have attempted to measure how strong these effects are relative to other factors influencing children's food choices. Nonetheless, many studies have found clear effects and they have used sophisticated methodologies that make it possible to determine that i) these effects are not just due to chance; ii) they are independent of other factors that may influence diet, such as parents' eating habits or attitudes; and iii) they occur at a brand and category level.

- F. Furthermore, two factors suggest that these findings actually downplay the effect that food promotion has on children. First, the literature focuses principally on television advertising; the cumulative effect of this combined with other forms of promotion and marketing is likely to be significantly greater. Second, the studies have looked at direct effects on individual children, and understate indirect influences. For example, promotion for fast food outlets may not only influence the child, but also encourage parents to take them for meals and reinforce the idea that this is a normal and desirable behaviour.
- G. This does not amount to proof of an effect, but in our view does provide sufficient evidence to conclude that an effect exists. The debate should now shift to what action is needed, and specifically to how the power of commercial marketing can be used to bring about improvements in young people's eating.

Questions 8-13

Do the following statements agree with the views of the writer in Reading Passage 1? Write

- | | |
|------------------|---|
| YES | <i>if the statement agrees with the views of the writer</i> |
| NO | <i>if the statement contradicts with the views of the writer</i> |
| NOT GIVEN | <i>if it is impossible to say what the writer thinks about this</i> |

8. There is little difference between the number of healthy food advertisements and the number of unhealthy food advertisements.
9. TV advertising has successfully taught children nutritional knowledge about vitamins and others.
10. It is hard to decide which aspect of TV viewing has caused weight problems of children.
11. The preference of food for children is affected by their age and gender.
12. Wealthy parents tend to buy more "sensible food" for their children.
13. There is a lack of investigation on food promotion methods other than TV advertising.

READING PASSAGE 2

THE SWAYING BRIDGE

When the London Millennium footbridge was opened in June 2000, it swayed alarmingly. This generated huge public interest and the bridge became known as London's "wobbly bridge."

The Millennium Bridge is the first new bridge across the river Thames in London since Tower Bridge opened in 1894, and it is the first ever designed for pedestrians only. The bridge links the City of London near St Paul's Cathedral with the Tate Modern art gallery on Bankside.

The bridge opened initially on Saturday 10th June 2000. For the opening ceremony, a crowd of over 1,000 people had assembled on the south half of the bridge with a band in front. When they started to walk across with the band playing, there was immediately an unexpectedly pronounced lateral movement of the bridge deck. "It was a fine day and the bridge was on the route of a major charity walk," one of the pedestrians recounted what he saw that day. "At first, it was still. Then it began to sway sideways, just slightly. Then, almost from one moment to the next, when large groups of people were crossing, the wobble intensified. Everyone had to stop walking to retain balance and sometimes to hold onto the hand rails for support." Immediately it was decided to limit the number of people on the bridge, and the bridge was dubbed the 'wobbly' bridge by the media who declared it another high-profile British Millennium Project failure. In order to fully investigate and resolve the issue the decision was taken to close the bridge on 12th June 2000.

Arup, the leading member of the committee in charge of the construction of the bridge, decided to tackle the issue head on. They immediately undertook a fast-track research project to seek the cause and the cure. The embarrassed engineers found the videotape that day which showed the center span swaying about 3 inches sideways every second and the south span 2 inches every 1.25 seconds. Because there was a significant wind blowing on the opening days (force 3-4) and the bridge had been decorated with large flags, the engineers first thought that winds might be exerting excessive force on the many large flags and banners, but it was rapidly concluded that wind buffeting had not contributed significantly to vibration of the bridge. But after measurements were made in university laboratories of the effects of people walking on swaying platforms and after large-scale experiments with crowds of pedestrians were conducted on the bridge itself, a new understanding and a new theory were developed.

The unexpected motion was the result of a natural human reaction to small lateral movements. It is well known that a suspension bridge has tendency to sway when troops march over it in lockstep, which is why troops are required to break step when crossing such a bridge. "If we walk on a swaying surface we tend to compensate and stabilise ourselves by spreading our legs further apart but this increases the lateral push". Pat Dallard, the engineer at Arup, says that you change the way you walk to match what the bridge is doing. It is an unconscious tendency for pedestrians to match

their footsteps to the sway, thereby exacerbating it even more. "It's rather like walking on a rolling ship deck - you move one way and then the other to compensate for the roll." The way people walk doesn't have to match exactly the natural frequency of the bridge as in resonance the interaction is more subtle. As the bridge moves, people adjust the way they walk in their own manner. The problem is that when there are enough people on the bridge the total sideways push can overcome the bridge's ability to absorb it. The movement becomes excessive and continues to increase until people begin to have difficulty in walking-they may even have to hold on to the rails.

Professor Fujino Yozo of Tokyo University, who studied the earth-resistant Toda Bridge in Japan, believes the horizontal forces caused by walking, running or jumping could also in turn cause excessive dynamic vibration in the lateral direction in the bridge. He explains that as the structure began moving, pedestrians adjusted their gait to the same lateral rhythm as the bridge; the adjusted footsteps magnified the motion-just like when four people all stand up in small boat at the same time. As more pedestrians locked into the same rhythm, the increasing oscillation led to the dramatic swaying captured on film until people stopped walking altogether, because they could not even keep upright.

In order to design a method of reducing the movements, an immediate research program was launched by the bridge's engineering designer Arup. It was decided that the force exerted by the pedestrians had to be quantified and related to the motion of the bridge. Although there are some descriptions of this phenomenon in existing literature, none of these actually quantifies the force. So there was no quantitative analytical way to design the bridge against this effect. The efforts to solve the problem quickly got supported by a number of universities and research organisations.

The tests at the University of Southampton involved a person walking on the spot on a small shake table. The tests at Imperial College involved persons walking along a specially built, 7.2m-long platform, which could be driven laterally at different frequencies and amplitudes. These tests have their own limitations. While the Imperial College test platform was too short that only seven or eight steps could be measured at one time, the "walking on the spot" test did not accurately replicate forward walking, although many footsteps could be observed using this method. Neither test could investigate any influence of other people in a crowd on the behavior of the individual tested.

The results of the laboratory tests provided information, which enabled the initial design of a retrofit to be progressed. However, unless the usage of the bridge was to be greatly restricted, only two generic options to improve its performance were considered feasible. The first was to increase the stiffness of the bridge to move all its lateral natural frequencies out of the range that could be excited by the lateral footfall forces, and the second was to increase the damping of the bridge to reduce the resonant response.

Questions 14-17

Choose **FOUR** letters, A-I. Write the correct letters in boxes 14-17 on your answer sheet. Which **FOUR** of the following could be seen on the day when the bridge opened to the public?

- A. the bridge moved vertically
- B. the bridge swayed from side to side
- C. the bridge swayed violently throughout the opening ceremony
- D. it was hard to keep balance on the bridge
- E. pedestrians walked in synchronized steps
- F. pedestrians lengthened their footsteps
- G. a music band marched across the bridge
- H. the swaying rhythm varied to the portions of the bridge
- I. flags and banners kept still on the bridge

Questions 18-23

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 18-23 on your answer sheet.

To understand why the Millennium Bridge swayed, engineers of Arup studied the videotape taken on the day of the opening ceremony. In the beginning they thought the forces of 18)..... might have caused the movement because there were many flags and banners on the bridge that day. But quickly new understandings arose after series of tests were conducted on how people walk on 19)..... floors. The tests showed people would place their legs 20)..... to keep balance when the floor is shaking. Pat Dallard even believes pedestrians may unknowingly adjust their 21)..... to match the sway of the bridge. Professor Fujino Yozo's study found that the vibration of a bridge could be caused by the 22)..... of people walking, running and jumping on it because the lateral rhythm of the sway could make pedestrians adjust their walk and reach the same step until it is impossible to stand 23).....

Questions 24-26

Complete the table below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 24-26 on your answer sheet.

Test conducted by	Problems of the test
24 _____	Not enough data collection
25 _____	Not long enough
26 _____	Not like the real walking experience

READING PASSAGE 3

INTERNAL MARKET: SELLING THE BRAND TO THE EMPLOYEES

When you think of marketing, you more than likely think of marketing to your customers: How can you persuade more people to buy what you sell? But another "market" is just as important: your employees, the very people who can make the brand come alive for your customers. Yet in our work helping executives develop and carry out branding campaigns, my colleagues and I have found that companies very often ignore this critical constituency.

Why is internal marketing so important? First, because it's the best way to help employees make a powerful emotional connection to the products and services you sell. Without that connection, employees are likely to undermine the expectations set by your advertising. In some cases, this is because they simply don't understand what you have promised the public, so they end up working at cross-purposes. In other cases, it maybe they don't actually believe in the brand and feel disengaged or, worse, hostile toward the company. We've found that when people care about and believe in the brand, they're motivated to work harder and their loyalty to the company increases. Employees are united and inspired by a common sense of purpose and identity.

Unfortunately, in most companies, internal marketing is done poorly, if at all. While executives recognise the need to keep people informed about the company's strategy and direction, few understand the need to convince employees of the brand's power—they take it as a given.

Employees need to hear the same messages that you send out to the marketplace. At most companies, however, internal and external communications are often mismatched. This can be very confusing, and it threatens employees' perceptions of the company's integrity: They are told one thing by management but observe that a different message is being sent to the public. One health insurance company, for instance, advertised that the welfare of patients was the company's number one priority, while employees were told that their main goal was to increase the value of their stock options through cost reductions. And one major financial services institution told customers that it was making a major shift in focus from being a financial retailer to a financial adviser, but, a year later, research showed that the customer experience with the company had not changed. It turned out that company leaders had not made an effort to sell the change internally, so employees were still churning out transactions and hadn't changed their behavior to match their new adviser role.

Enabling employees to deliver on customer expectations is important, of course, but it's not the only reason a company needs to match internal and external messages. Another reason is to help push the company to achieve goals that might otherwise be out of reach. In 1997, when IBM launched its e-business campaign (which is widely credited for turning around the company's image), it chose to ignore research that suggested consumers were unprepared to embrace IBM as a leader in e-business:

Although to the outside world this looked like an external marketing effort, IBM was also using the campaign to align employees around the idea of the Internet as the future of technology. The internal campaign changed the way employees thought about everything they did, from how they named products to how they organised staff to how they approached selling. The campaign was successful largely because it gave employees a sense of direction and purpose, which in turn restored their confidence in IBM's ability to predict the future and lead the technology industry. Today, research shows that people are four times more likely to associate the term "e-business" with IBM than with its nearest competitor.

Perhaps even more important, by taking employees into account, a company can avoid creating a message that doesn't resonate with staff or, worse, one that builds resentment. In 1996, United Airlines shelved its "Come Fly the Friendly Skies" slogan when presented with a survey that revealed the depth of customer resentment toward the airline industry. In an effort to own up to the industry's shortcomings, United launched a new campaign, "Rising," in which it sought to differentiate itself by acknowledging poor service and promising incremental improvements such as better meals. While this was a logical premise for the campaign given the tenor of the times, a campaign focusing on customers' distaste for flying was deeply discouraging to the staff. Employee resentment ultimately made it impossible for United to deliver the improvements it was promising, which in turn undermined the "Rising" pledge. Three years later, United decided employee opposition was undermining its success and pulled the campaign. It has since moved to a more inclusive brand message with the line "United," which both audiences can embrace. Here, a fundamental principle of advertising—find and address a customer concern—failed United because it did not consider the internal market.

When it comes to execution, the most common and effective way to link internal and external marketing campaigns is to create external advertising that targets both audiences. IBM used this tactic very effectively when it launched its e-business campaign. It took out an eight-page ad in the Wall Street Journal declaring its new vision, a message directed at both customers and internal stakeholders. This is an expensive way to capture attention, but if used sparingly, it is the most powerful form of communication; in fact, you need do it only once for everyone in the company to read it. There's a symbolic advantage as well. Such a tactic signals that the company is taking its pledge very seriously; it also signals transparency—the same message going out to both audiences.

Advertising isn't the only way to link internal and external marketing. At Nike, a number of senior executives now hold the additional title of "Corporate Storyteller." They deliberately avoid stories of financial successes and concentrate on parables of "just doing it," reflecting and reinforcing the company's ad campaigns. One tale, for example, recalls how legendary coach and Nike cofounder Bill Bowerman, in an effort to build a better shoe for his team, poured rubber into the family waffle iron, giving birth to the prototype of Nike's famous Waffle Sole. By talking about such inventive moves, the company hopes to keep the spirit of innovation that characterizes its ad

campaigns alive and well within the company.

But while their messages must be aligned, companies must also keep external promises a little ahead of internal realities. Such promises provide incentives for employees and give them something to live up to. In the 1980s, Ford turned "Quality Is Job 1" from an internal rallying cry into a consumer slogan in response to the threat from cheaper, more reliable Japanese cars. It did so before the claim was fully justified, but by placing it in the public arena, it gave employees an incentive to match the Japanese. If the promise is pushed too far ahead, however, it loses credibility. When a beleaguered British Rail launched a campaign announcing service improvements under the banner "We're Getting There," it did so prematurely. By drawing attention to the gap between the promise and the reality, it prompted destructive press coverage. This, in turn, demoralized the staff, who had been legitimately proud of the service advances they had made.

Questions 27-32

Complete each sentence with the correct ending, A-E, below. Write the correct letter, A-E, in boxes 27-32 on your answer sheet. NB You can use any letter more than once.

- 27. A health company
- 28. A financial institution
- 29. A computer company
- 30. An airline
- 31. A sport shoe company
- 32. A railway company

- A alienated its employees by its apologetic branding campaign.
- B attracted negative publicity through its advertising campaign.
- C produced conflicting image between its employees and the general public.
- D successfully used an advertising campaign to inspire employees.
- E draws on the legends of the company spirit.

Questions 33-40

Do the following statements agree with the claims of the writer in Reading Passage 3? Write

- | | |
|------------------|---|
| YES | <i>if the statement agrees with the claims of the writer</i> |
| NO | <i>if the statement contradicts with the claims of the writer</i> |
| NOT GIVEN | <i>if it is impossible to say what the writer thinks about this</i> |

33. A strong conviction in the brand can contribute to higher job performance.
34. It is common for companies to overlook the necessity for internal communication.
35. Consumers were ready to view IBM as a leader in e-business before the advertising campaign.
36. United Airlines' failure in its branding campaign was due to the bad advice of an advertisement agency.
37. United Airlines eventually abolished its campaign to boost image as the result of a market research.
38. It is an expensive mistake for IBM to launch its new e-business campaign.
39. Nike employees claimed that they were inspired by their company tales.
40. A slight difference between internal and external promises can create a sense of purpose.

EXAM READING 22

READING PASSAGE 1

THE FORGOTTEN WOODLANDS

Found only in the Deep South of America, longleaf pine woodlands have dwindled to about 3 percent of their former range, but new efforts are under way to restore them.

THE BEAUTY AND THE BIODIVERSITY of the longleaf pine forest are well-kept secrets, even in its native South. Yet it is among the richest ecosystems in North America, rivaling tall grass prairies and the ancient forests of the Pacific Northwest in the number of species it shelters. And like those two other disappearing wildlife habitats, longleaf is also critically endangered.

In longleaf pine forests, trees grow widely scattered, creating an open, park like environment, more like a savanna than a forest. The trees are not so dense as to block the sun. This openness creates a forest floor that is among the most diverse in the world, where plants such as many-flowered grass pinks, trumpet pitcher plants, Venus flytraps, lavender ladies and pineland bog-buttons grow. As many as 50 different species of wildflowers, shrubs, grasses and ferns have been cataloged in just a single square meter.

Once, nearly 92 million acres of longleaf forest flourished from Virginia to Texas, the only place in the world where it is found. By the turn of the 21st century, however, virtually all of it had been logged, paved or farmed into oblivion. Only about 3 percent of the original range still supports longleaf forest, and only about 10,000 acres of that is uncut old-growth—the rest is forest that has regrown after cutting. An estimated 100,000 of those acres are still vanishing every year. However, a quiet movement to reverse this trend is rippling across the region. Governments, private organisations (including NWF) and individual conservationists are looking for ways to protect and preserve the remaining longleaf and to plant new forests for future generations.

Figuring out how to bring back the piney woods also will allow biologists to help the plants and animals that depend on this habitat. Nearly two-thirds of the declining, threatened or endangered species in the southeastern United States are associated with longleaf. The outright destruction of longleaf is only part of their story, says Mark Danaher, the biologist for South Carolina's Francis Marion National Forest. He says the demise of these animals and plants also is tied to a lack of fire, which once swept through the southern forests on a regular basis. "Fire is absolutely critical for this ecosystem and for the species that depend on it," says Danaher.

Name just about any species that occurs in longleaf and you can find a connection to fire. Bachman's sparrow is a secretive bird with a beautiful song that echoes across the longleaf flatwoods. It tucks its nest on the ground beneath clumps of wiregrass and little bluestem in the open understory. But once fire has been absent for several years, and a tangle of shrubs starts to grow, the sparrows disappear. Gopher tortoises, the only native land tortoises east of the

Mississippi, are also abundant in longleaf. A keystone species for these forests, its burrows provide homes and safety to more than 300 species of vertebrates and invertebrates ranging from eastern diamond-back rattlesnakes to gopher frogs. If fire is suppressed, however, the tortoises are choked out. "If we lose fire," says Bob Mitchell, an ecologist at the Jones Center, "we lose wildlife."

Without fire, we also lose longleaf. Fire knocks back the oaks and other hardwoods that can grow up to overwhelm longleaf forests. "They are fire forests," Mitchell says. "They evolved in the lightning capital of the eastern United States." And it wasn't only lightning strikes that set the forest aflame. "Native Americans also lit fires to keep the forest open," Mitchell says. "So did the early pioneers. They helped create the longleaf pine forests that we know today."

Fire also changes how nutrients flow throughout longleaf ecosystems; in ways we are just beginning to understand. For example, researchers have discovered that frequent fires provide extra calcium, which is critical for egg production, to endangered red-cockaded woodpeckers. Frances James, a retired avian ecologist from Florida State University, has studied these small black-and-white birds for more than two decades in Florida's sprawling Apalachicola National Forest. When she realised female woodpeckers laid larger clutches in the first breeding season after their territories were burned, she and her colleagues went searching for answers. "We learned calcium is stashed away in woody shrubs when the forest is not burned," James says. "But when there is a fire, a pulse of calcium moves down into the soil and up into the longleaf." Eventually, this calcium makes its way up the food chain to a tree-dwelling species of ant, which is the red-cockaded's favorite food. The result: more calcium for the birds, which leads to more eggs, more young and more woodpeckers.

Today, fire is used as a vital management tool for preserving both longleaf and its wildlife. Most of these fires are prescribed burns, deliberately set with a drip torch. Although the public often opposes any type of fire—and the smoke that goes with it—these frequent, low-intensity burns reduce the risk of catastrophic conflagrations. "Forests are going to burn," says Amadou Diop, NWF's southern forests restoration manager "It's just a question of when. With prescribed burns, we can pick the time and the place."

Diop is spearheading a new NWF effort to restore longleaf. "It's a species we need to go back to," he says. Educating landowners about the advantages of growing longleaf is part of the program, he adds, which will soon be under way in nine southern states. "Right now, most longleaf is on public land," says Jerry McCollum, president of the Georgia Wildlife Federation. "Private land is where we need to work," he adds, pointing out that more than 90 percent of the acreage within the historic range of longleaf falls under this category

Interest among private landowners is growing throughout the South, but restoring longleaf is not

an easy task. The herbaceous layer—the understory of wiregrasses and other plants—also needs to be re-created. In areas where the land has not been chewed up by farming, but converted to loblolly or slash pine plantations, the seed bank of the longleaf forest usually remains viable beneath the soil. In time, this original vegetation can be coaxed back. Where agriculture has destroyed the seeds, however, wiregrass must be replanted. Right now, the expense is prohibitive, but researchers are searching for low-cost solutions.

Bringing back longleaf is not for the short-sighted, however. Few of us will be alive when the pines being planted today become mature forests in 70 to 80 years. But that is not stopping long-leaf enthusiasts. "Today, it's getting hard to find longleaf seedlings to buy," one of the private landowners says. "Everyone wants them. Longleaf is in a resurgence."

Questions 1-5

Complete the notes below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 1-5 on your answer sheet

Forest fire ensures that:

- Birds can locate their 1 _____ in the ground.
- The burrows of a species of 2 _____ provide homes to many other animals.
- Hardwoods such as 3 _____ can grow and outnumber long leaf trees.

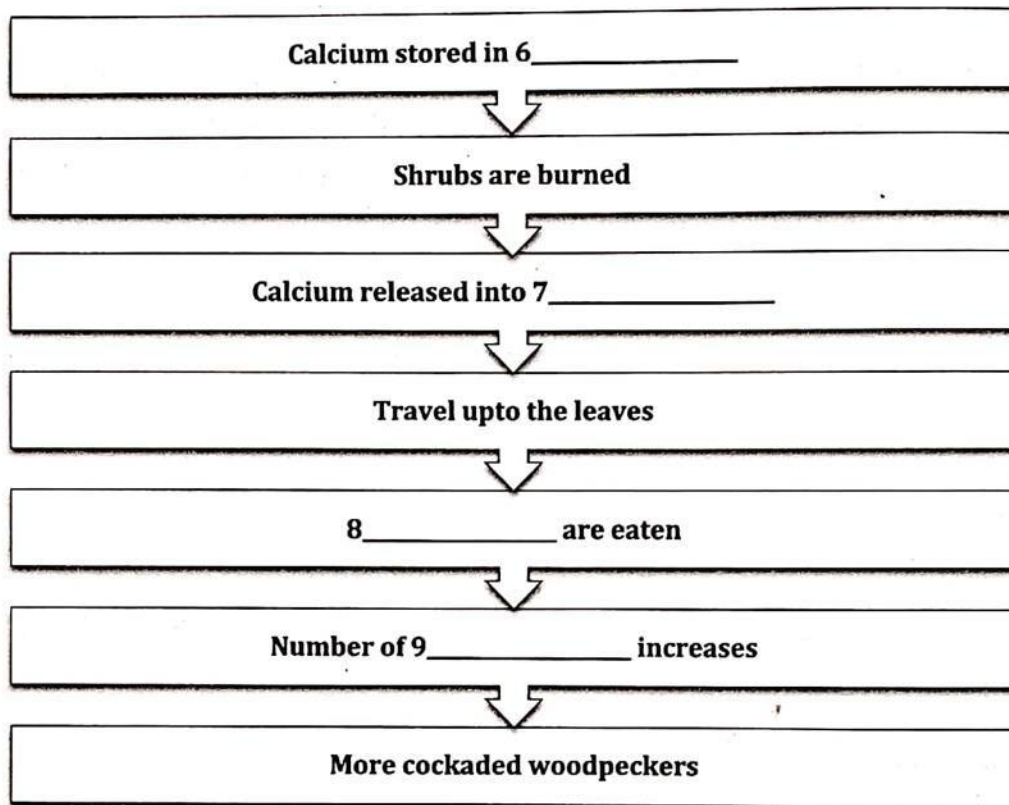
Apart from fires lit by lightning:

- Fires are created by 4 _____ and settlers.
- Fires deliberately lit are called 5 _____.

Questions 6-9

Complete the flow-chart below. Choose **ONE WORD ONLY** from the passage for each answer. Write your answers in boxes 6-9 on your answer sheet.

How to increase the number of cockaded woodpeckers



Questions 10-13

Do the following statements agree with the information given in Reading Passage 1?

In boxes 10-13 on your answer sheet, write

- TRUE if the statement agrees with the information
 FALSE if the statement disagrees with the information
 NOT GIVEN if there is no information on this

10. The sparse distribution of longleaf pine trees leads to the most diversity of species.
11. It is easier to restore forests converted to farms than forests converted to plantations.
12. The cost to restore forest is increasing recently.
13. Few can live to see the replanted forest reach its maturity.

READING PASSAGE 2

STORYTELLING, FROM PREHISTORIC TO THE MODERN TIMES

- A. It was told, we suppose, to people crouched around a fire: a tale of adventure, most likely—relating some close encounter with death; a remarkable hunt, an escape from mortal danger; a vision, or something else out of the ordinary. Whatever its thread, the weaving of this story was done with a prime purpose. The listeners must be kept listening. They must not fall asleep. So, as the story went on, its audience should be sustained by one question above all. What happens next?
- B. The first fireside stories in human history can never be known. They were kept in the heads of those who told them. This method of storage is not necessarily inefficient. From documented oral traditions in Australia, the Balkans and other parts of the world we know that specialised storytellers and poets can recite from memory literally thousands of lines, in verse or prose, verbatim—word for word. But while memory is rightly considered an art in itself, it is clear that a primary purpose of making symbols is to have a system of reminders or mnemonic cues—signs that assist us to recall certain information in the mind's eye.
- C. In some Polynesian communities a notched memory stick may help to guide a storyteller through successive stages of recitation. But in other parts of the world, the activity of storytelling historically resulted in the development or even the invention of writing systems. One theory about the arrival of literacy in ancient Greece, for example, argues that the epic tales about the Trojan War and the wanderings of Odysseus—traditionally attributed to Homer—were just so enchanting to hear that they had to be preserved. So the Greeks, c. 750-700BC, borrowed an alphabet from their neighbors in the eastern Mediterranean, the Phoenicians.
- D. The custom of recording stories on parchment and other materials can be traced in many manifestations around the world, from the priestly papyrus archives of ancient Egypt to the birch-bark scrolls on which the North American Ojibway Indians set down their creation-myth. It is a well-trying and universal practice: so much so that to this day storytime is probably most often associated with words on paper. The formal practice of narrating a story aloud would seem—so we assume—to have given way to newspapers, novels and comic strips. This, however, is not the case. Statistically it is doubtful that the majority of humans currently rely upon the written word to get access to stories. So what is the alternative source?
- E. Each year, over 7 billion people will go to watch the latest offering from Hollywood, Bollywood and beyond. The supreme storyteller of today is cinema. The movies, as distinct from still photography, seem to be an essentially modern phenomenon. This is an illusion, for there are, as we shall see, certain ways in which the medium of film is indebted to very old precedents of arranging 'sequences' of images. But any account of visual storytelling must begin with the recognition that all storytelling beats with a deeply atavistic pulse: that is, a 'good story' relies

upon formal patterns of plot and characterisation that have been embedded in the practice of storytelling over many generations.

- F. Thousands of scripts arrive every week at the offices of the major film studios. But aspiring screenwriters really need look no further for essential advice than the fourth-century BC Greek Philosopher Aristotle. He left some incomplete lecture notes on the art of telling stories in various literary and dramatic modes, a slim volume known as *The Poetics*. Though he can never have envisaged the popcorn-fuelled actuality of a multiplex cinema, Aristotle is almost prescient about the key elements required to get the crowds flocking to such a cultural hub. He analyzed the process with cool rationalism. When a story enchants us, we lose the sense of where we are; we are drawn into the story so thoroughly that we forget it is a story being told. This is, in Aristotle's phrase, 'the suspension of disbelief.'
- G. We know the feeling. If ever we have stayed in our seats, stunned with grief, as the credits roll by, or for days after seeing that vivid evocation of horror have been nervous about taking a shower at home, then we have suspended disbelief. We have been caught, or captivated, in the storyteller's web. Did it all really happen? We really thought so—for a while. Aristotle must have witnessed often enough this suspension of disbelief. He taught at Athens, the city where theater developed as a primary form of civic ritual and recreation. Two theatrical types of storytelling, tragedy and comedy, caused Athenian audiences to lose themselves in sadness and laughter respectively. Tragedy, for Aristotle, was particularly potent in its capacity to enlist and then purge the emotions of those watching the story unfold on the stage, so he tried to identify those factors in the storyteller's art that brought about such engagement. He had, as an obvious sample for analysis, not only the fifth-century BC masterpieces of Classical Greek tragedy written by Aeschylus, Sophocles and Euripides. Beyond them stood Homer, whose stories even then had canonical status: *The Iliad* and *The Odyssey* were already considered literary landmarks—stories by which all other stories should be measured. So what was the secret of Homer's narrative art?
- H. It was not hard to find. Homer created credible heroes. His heroes belonged to the past, they were mighty and magnificent, yet they were not, in the end, fantasy figures. He made his heroes sulk, bicker, cheat and cry. They were, in short, characters—protagonists of a story that an audience would care about, would want to follow, would want to know what happens next. As Aristotle saw, the hero who shows a human side—some flaw or weakness to which mortals are prone—is intrinsically dramatic.

Questions 14-18

Reading Passage 2 has eight paragraphs, **A-H**. Which paragraph contains the following information? Write the correct letter, **A-H**, in boxes 14-18 on your answer sheet

- 14. A misunderstanding of how people today get stories
- 15. The categorisation of stories
- 16. The fundamental aim of storytelling
- 17. A description of reciting stories without any assistance
- 18. How to make story characters attractive

Questions 19-22

Classify the following information as referring to

- A** adopted the writing system from another country
- B** used organic materials to record stories
- C** used tools to help to tell stories

Write the correct letter, **A, B** or **C** in boxes 19-22 on your answer sheet.

- 19. Egyptians
- 20. Ojibway
- 21. Polynesians
- 22. Greek

Questions 23-26

Complete the sentences below with **ONE WORD ONLY** from the passage. Write your answers in boxes 23-26 on your answer sheet.

- 23. Aristotle wrote a book on the art of storytelling called _____.
- 24. Aristotle believed the most powerful type of story to move listeners is _____.
- 25. Aristotle viewed Homer's works as _____.
- 26. Aristotle believed attractive heroes should have some _____.

READING PASSAGE 3

Questions 27-33

Reading passage 3 has seven paragraphs, A-G. Choose the correct heading for paragraphs A-G from the list of headings below. Write the correct number, i-x, in boxes 27-33.

List of Headings

- i. Shaping and reforming
- ii. Causes of desertification
- iii. Need combination of specific conditions
- iv. Potential threat to industry and communication
- v. An old superstition demystified
- vi. Differences and similarities
- vii. A continuous cycling process
- viii. Habitat for rare species
- ix. Replicating the process in laboratory
- x. Commonest type of dune

- 27. Paragraph A
- 28. Paragraph B
- 29. Paragraph C
- 30. Paragraph D
- 31. Paragraph E
- 32. Paragraph F
- 33. Paragraph G

THE DYNAMIC DUNES

When you think of a sand dune, you probably picture a barren pile of lifeless sand. But sand dunes are actually dynamic natural structures. They grow, shift and travel. They crawl with living things. Some sand dunes even sing

A Although no more than a pile of wind-blown sand, dunes can roll over trees and buildings, march relentlessly across highways, devour vehicles on its path, and threaten crops and factories in Africa, the Middle East, and China. In some places, killer dunes even roll in and swallow up towns. Entire villages have disappeared under the sand. In a few instances the government built new villages for those displaced only to find that new villages themselves were buried several years later. Preventing sand dunes from overwhelming cities and agricultural areas has become a priority for the United Nations Environment Program.

B Some of the most significant experimental measurements on sand movement were performed by Ralph Bagnold, a British engineer who worked in Egypt prior to World War II. Bagnold investigated the physics of particles moving through the atmosphere and deposited by wind. He recognised two basic dune types, the crescentic dune, which he called "barchan," and the linear dune, which he called longitudinal or "sief" (Arabic for "sword"). The crescentic barchan dune is the most common type of sand dune. As its name suggests, this dune is shaped like a

crescent moon with points at each end, and it is usually wider than it is long. Some types of barchan dunes move faster over desert surfaces than any other type of dune. The linear dune is straighter than the crescentic dune with ridges as its prominent feature. Unlike crescentic dunes, linear dunes are longer than they are wide—in fact, some are more than 100 miles (about 160 kilometers) long. Dunes can also be comprised of smaller dunes of different types, called complex dunes.

C Despite the complicated dynamics of dune formation, Bagnold noted that a sand dune generally needs the following three things to form: a large amount of loose sand in an area with little vegetation—usually on the coast or in a dried-up river, lake or sea bed; a wind or breeze to move the grains of sand; and an obstacle, which could be as small as a rock or as big as a tree, that causes the sand to lose momentum and settle. Where these three variables merge, a sand dune forms.

D As the wind picks up the sand, the sand travels, but generally only about an inch or two above the ground, until an obstacle causes it to stop. The heaviest grains settle against the obstacle, and a small ridge or bump forms. The lighter grains deposit themselves on the other side of the obstacle. Wind continues to move sand up to the top of the pile until the pile is so steep that it collapses under its own weight. The collapsing sand comes to rest when it reaches just the right steepness to keep the dune stable. The repeating cycle of sand inching up the windward side to the dune crest, then slipping down the dune's slip face allows the dune to inch forward, migrating in the direction the wind blows.

E Depending on the speed and direction of the wind and the weight of the local sand, dunes will develop into different shapes and sizes. Stronger winds tend to make taller dunes; gentler winds tend to spread them out. If the direction of the wind generally is the same over the years, dunes gradually shift in that direction. But a dune is "a curiously dynamic creature", wrote Farouk El-Baz in *National Geographic*. Once formed, a dune can grow, change shape, move with the wind and even breed new dunes. Some of these offspring may be carried on the back of the mother dune. Others are born and race downwind, outpacing their parents.

F Sand dunes even can be heard 'singing' in more than 30 locations worldwide, and in each place the sounds have their own characteristic frequency, or note. When the thirteenth century explorer Marco Polo encountered the weird and wonderful noises made by desert sand dunes, he attributed them to evil spirits. The sound is unearthly. The volume is also unnerving. Adding to the tone's otherworldliness is the inability of the human ear to localise the source of the noise. *Stephane Douady* of the French national research agency CNRS and his colleagues have been delving deeper into dunes in Morocco, Chile, China and Oman, and believe they can now explain the exact mechanism behind this acoustic phenomenon.

G The group hauled sand back to the laboratory and set it up in channels with automated pushing plates. The sands still sang, proving that the dune itself was not needed to act as a resonating body for the sound, as some researchers had theorized. To make the booming sound, the grains have to be of a small range of sizes, all alike in shape: well-rounded. Douady's key discovery was that this synchronized frequency—which determines the tone of sound—is the result of the grain size. The larger the grain, the lower the key. He has successfully predicted the notes emitted by dunes in Morocco, Chile and the US simply by measuring the size of the grains they contain. Douady also discovered that the singing grains had some kind of varnish or a smooth coating of various minerals: silicon, iron and manganese, which probably formed on the sand when the dunes once lay beneath an ancient ocean. But in the muted grains this coat had been worn away, which explains why only some dunes can sing. He admits he is unsure exactly what role the coating plays in producing the noise. The mysterious dunes, it seems, aren't quite ready yet to give up all of their secrets.

Questions 34-36

Complete the sentences below. Choose **ONE WORD ONLY** from the passage for each answer. Write your answers in boxes 34-36 on your answer sheet.

34. _____ dune is said to have long ridges that can extend hundreds of miles.
35. According to Bagnold, an _____ is needed to stop the sand from moving before a dune can form.
36. Stephane Douady believes the singing of dunes is not a spiritual phenomenon, but purely _____.

Questions 37-40

Complete the summary below. Choose **ONE WORD ONLY** from the passage for each answer. Write your answers in boxes 37-40 on your answer sheet.

There are many different types of dunes, two of which are most commonly found in deserts throughout the world, the linear dune and the 37 _____ dune, sometimes also known as the crescentic dune. It's been long known that in some places dunes can even sing and the answer lies in the sand itself. To produce singing sand in lab, all the sands must have similar 38 _____. And scientists have discovered that the size of the sand can affect the 39 _____ of the sound. But the function of the varnish composed by a mixture of 40 _____ still remains puzzling.

EXAM READING 23

READING PASSAGE 1

TYPES OF SOCIETIES

Although humans have established many types of societies throughout history, sociologists and anthropologists tend to classify different societies according to the degree to which different groups within a society have unequal access to advantages such as resources, prestige or power, and usually refer to four basic types of societies. From least to most socially complex they are clans, tribes, chiefdoms and states.

Clan

These are small-scale societies of hunters and gatherers, generally of fewer than 100 people, who move seasonally to exploit wild (undomesticated) food resources. Most surviving hunter-gatherer groups are of this kind, such as the Hadza of Tanzania or the San of southern Africa. Clan members are generally kinsfolk, related by descent or marriage. Clans lack formal leaders, so there are no marked economic differences or disparities in status among their members.

Because clans are composed of mobile groups of hunter-gatherers, their sites consist mainly of seasonally occupied camps, and other smaller and more specialised sites. Among the latter are kill or butchery sites—locations where large mammals are killed and sometimes butchered—and work sites, where tools are made or other specific activities carried out. The base camp of such a group may give evidence of rather insubstantial dwellings or temporary shelters, along with the debris of residential occupation.

Tribe

These are generally larger than mobile hunter-gatherer groups, but rarely number more than a few thousand, and their diet or subsistence is based largely on cultivated plants and domesticated animals. Typically, they are settled farmers, but they may be nomadic with a very different, mobile economy based on the intensive exploitation of livestock. These are generally multi-community societies, with the individual communities integrated into the larger society through kinship ties. Although some tribes have officials and even a "capital" or seat of government, such officials lack the economic base necessary for effective use of power.

The typical settlement pattern for tribes is one of settled agricultural homesteads or villages. Characteristically, no one settlement dominates any of the others in the region. Instead, the archaeologist finds evidence for isolated, permanently occupied houses or for permanent villages. Such villages may be made up of a collection of free-standing houses, like those of the first farms of the Danube valley in Europe. Or they may be clusters of buildings grouped together, for example, the pueblos of the American Southwest, and the early farming village or small town of Catalhöyük in modern Turkey.

Chieftdom

These operate on the principle of ranking—differences in social status between people. Different lineages (a lineage is a group claiming descent from a common ancestor) are graded on a scale of prestige, and the senior lineage, and hence the society as a whole, is governed by a chief. Prestige and rank are determined by how closely related one is to the chief, and there is no true stratification into classes. The role of the chief is crucial.

Often, there is local specialisation in craft products, and surpluses of these and of foodstuffs are periodically paid as obligation to the chief. He uses these to maintain his retainers, and may use them for redistribution to his subjects. The chieftdom generally has a center of power, often with temples, residences of the chief and his retainers, and craft specialists. Chieftdoms vary greatly in size, but the range is generally between about 5000 and 20,000 persons.

Early State

These preserve many of the features of chieftdoms, but the ruler (perhaps a king or sometimes a queen) has explicit authority to establish laws and also to enforce them by the use of a standing army. Society no longer depends totally upon kin relationships: it is now stratified into different classes. Agricultural workers and the poorer urban dwellers form the lowest classes, with the craft specialists above, and the priests and kinsfolk of the ruler higher still. The functions of the ruler are often separated from those of the priest: palace is distinguished from temple. The society is viewed as a territory owned by the ruling lineage and populated by tenants who have an obligation to pay taxes. The central capital houses a bureaucratic administration of officials, one of their principal purposes is to collect revenue (often in the form of taxes and tolls) and distribute it to government, army and craft specialists. Many early states developed complex redistribution systems to support these essential services.

This rather simple social typology, set out by Elman Service and elaborated by William Sanders and Joseph Marino, can be criticised, and it should not be used unthinkingly. Nevertheless, if we are seeking to talk about early societies, we must use words and hence concepts to do so. Service's categories provide a good framework to help organise our thoughts.

Questions 1-7

Do the following statements agree with the information given in Reading Passage 1?

In boxes 1-7 on your answer sheet, write

- TRUE** if the statement agrees with the information
FALSE if the statement contradicts the information
NOT GIVEN if there is no information on this

1. There's little economic difference between members of a clan.
2. The farmers of a tribe grow a wide range of plants.
3. One settlement is more important than any other settlements in a tribe.
4. A member's status in a chiefdom is determined by how much land he owns.
5. There are people who craft goods in chiefdoms.
6. The king keeps the order of a state by using an army.
7. Bureaucratic officers receive higher salaries than other members.

Questions 8-13

Answer the questions below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 8-13 on your answer sheet.

8. What are made at the clan work sites?
9. What is the other way of life for tribes besides settled farming?
10. How are Çatalhöyük's housing units arranged?
11. What does a chief give to his subjects as rewards besides crafted goods?
12. What is the largest possible population of a chiefdom?
13. Which group of people is at the bottom of an early state but higher than the farmers?

READING PASSAGE 2

THYLACINE – THE TASMANIAN TIGER

Although it was called tiger, it looked like a dog with black stripes on its back and it was the largest known carnivorous marsupial of modern times. Yet, despite its fame for being one of the most fabled animals in the world, it is one of the least understood of Tasmania's native animals. The scientific name for the Tasmanian tiger is Thylacine and it is believed that they have become extinct in the 20th century.

Fossils of thylacines dating from about almost 12 million years ago have been dug up at various places in Victoria, South Australia and Western Australia. They were widespread in Australia 7,000 years ago, but have probably been extinct on the continent for 2,000 years. This is believed to be because of the introduction of dingoes around 8,000 years ago. Because of disease, thylacine numbers may have been declining in Tasmania at the time of European settlement 200 years ago, but the decline was certainly accelerated by the new arrivals. The last known Tasmanian Tiger died in Hobart Zoo in 1936 and the animal is officially classified as extinct. Technically, this means that it has not been officially sighted in the wild or captivity for 50 years. However, there are still unsubstantiated sightings.

Hans Naarding, whose study of animals had taken him around the world, was conducting a survey of a species of endangered migratory bird. What he saw that night is now regarded as the most credible sighting recorded of thylacine that many believe has been extinct for more than 70 years.

"I had to work at night," Naarding takes up the story. "I was in the habit of intermittently shining a spotlight around. The beam fell on an animal in front of the vehicle, less than 10m away. Instead of risking movement by grabbing for a camera, I decided to register very carefully what I was seeing. The animal was about the size of a small shepherd dog, a very healthy male in prime condition. What set it apart from a dog, though, was a slightly sloping hindquarter, with a fairly thick tail being a straight continuation of the backline of the animal. It had 12 distinct stripes on its back, continuing onto its butt. I knew perfectly well what I was seeing. As soon as I reached for the camera, it disappeared into the tea-tree undergrowth and scrub."

The director of Tasmania's National Parks at the time, Peter Morrow, decided in his wisdom to keep Naarding's sighting of the thylacine secret for two years. When the news finally broke, it was accompanied by pandemonium. "I was besieged by television crews, including four to five from Japan, and others from the United Kingdom, Germany, New Zealand and South America," said Naarding.

Government and private search parties combed the region, but no further sightings were made. The tiger, as always, had escaped to its lair, a place many insist exists only in our imagination. But since then, the thylacine has staged something of a comeback, becoming part of Australian

mythology.

There have been more than 4,000 claimed sightings of the beast since it supposedly died out, and the average claims each year reported to authorities now number 150. Associate professor of zoology at the University of Tasmania, Randolph Rose, has said he dreams of seeing a thylacine. But Rose, who in his 35 years in Tasmanian academia has fielded countless reports of thylacine sightings, is now convinced that his dream will go unfulfilled.

"The consensus among conservationists is that, usually, any animal with a population base of less than 1,000 is headed for extinction within 60 years," says Rose. "Sixty years ago, there was only one thylacine that we know of, and that was in Hobart Zoo," he says.

Dr. David Pemberton, curator of zoology at the Tasmanian Museum and Art Gallery, whose PhD thesis was on the thylacine, says that despite scientific thinking that 500 animals are required to sustain a population, the Florida panther is down to a dozen or so animals and, while it does have some inbreeding problems, is still ticking along. "I'll take a punt and say that, if we manage to find a thylacine in the scrub, it means that there are 50-plus animals out there."

After all, animals can be notoriously elusive. The strange fish known as the coelacanth, with its "proto-legs", was thought to have died out along with the dinosaurs 700 million years ago until a specimen was dragged to the surface in a shark net off the south-east coast of South Africa in 1938.

Wildlife biologist Nick Mooney has the unenviable task of investigating all "sightings" of the tiger totalling 4,000 since the mid-1930s, and averaging about 150 a year. It was Mooney who was first consulted late last month about the authenticity of digital photographic images purportedly taken by a German tourist while on a recent bushwalk in the state. On face value, Mooney says, the account of the sighting, and the two photographs submitted as proof, amount to one of the most convincing cases for the species' survival he has seen.

And Mooney has seen it all—the mistakes, the hoaxes, the illusions and the plausible accounts of sightings. Hoaxers aside, most people who report sightings end up believing they have seen a thylacine, and are themselves believable to the point they could pass a lie-detector test, according to Mooney. Others, having tabled a creditable report, then become utterly obsessed like the Tasmanian who has registered 99 thylacine sightings to date. Mooney has seen individuals bankrupted by the obsession, and families destroyed. "It is a blind optimism that something is, rather than a cynicism that something isn't," Mooney says. "If something crosses the road, it's not a case of 'I wonder what that was?' Rather, it is a case of 'that's a thylacine!' It is a bit like a gold prospector's blind faith, 'it has got to be there'."

However, Mooney treats all reports on face value. "I never try to embarrass people, or make fools of them. But the fact that I don't pack the car immediately they ring can often be taken as ridicule. Obsessive characters get irate that someone in my position is not out there when they think the thylacine is there."

But Hans Naarding, whose sighting of a striped animal two decades ago was the highlight of "a life of animal spotting", remains bemused by the time and money people waste on tiger searches. He says resources would be better applied to saving the Tasmanian devil, and helping migratory bird populations that are declining as a result of shrinking wetlands across Australia.

Could the thylacine still be out there? "Sure," Naarding says. But he also says any discovery of surviving thylacines would be "rather pointless". "How do you save a species from extinction? What could you do with it? If there are thylacines out there, they are better off right where they are."

Questions 14-17

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 14-17 on your answer sheet.

The Tasmanian tiger, also called thylacine, resembles the look of a dog and has 14)..... on its fur coat. Many fossils have been found, showing that thylacines had existed as early as 15)..... years ago. They lived throughout 16)..... before disappearing from the mainland. And soon after the 17)..... settlers arrived the size of thylacine population in Tasmania shrunk at a higher speed.

Questions 18-23

Look at the following statements (Questions 18-23) and the list of people below. Match each statement with the correct person, A, B, C or D. Write the correct letter, A, B, C or D, in boxes 18-23 on your answer sheet. **NB** You may use any letter more than once.

- 18. His report of seeing a live thylacine in the wild attracted international interest.
- 19. Many eye-witnesses' reports are not trustworthy.
- 20. It doesn't require a certain number of animals to ensure the survival of a species.
- 21. There is no hope of finding a surviving Tasmanian tiger.
- 22. Do not disturb them if there are any Tasmanian tigers still living today.
- 23. The interpretation of evidence can be affected by people's beliefs.

List of People

- A Hans Naarding
- B Randolph Rose
- C David Pemberton
- D Nick Mooney

Questions 24-26

Choose the correct letter, A, B, C or D. Write the correct letter in boxes 24-26 on your answer sheet.

- 24. Hans Naarding's sighting has resulted in
 - A) government and organisations' cooperative efforts to protect thylacine.
 - B) extensive interests to find a living thylacine.
 - C) increase of the number of reports of thylacine worldwide.
 - D) growth of popularity of thylacine in literature.
- 25. The example of coelacanth is to illustrate
 - A) it lived in the same period with dinosaurs.
 - B) how dinosaurs evolved legs.
 - C) some animals are difficult to catch in the wild.
 - D) extinction of certain species can be mistaken.
- 26. Mooney believes that all sighting reports should be
 - A) given some credit as they claim even if they are untrue.
 - B) acted upon immediately.
 - C) viewed as equally untrustworthy.
 - D) questioned and carefully investigated

READING PASSAGE 3

Questions 27-32

Reading Passage 3 has seven paragraphs, A-G. Choose the most suitable heading for paragraphs A-G from the list of headings below. Write the appropriate number, i-x, in boxes 27-32 on your answer sheet.

- | List of Headings | |
|------------------|--|
| i. | Examples of some scientific discoveries |
| ii. | Horace Walpole's fairy tale |
| iii. | Resolving the contradiction |
| iv. | What is the Scientific Method |
| v. | The contradiction of views on scientific discovery |
| vi. | Some misunderstandings of serendipity |
| vii. | Opponents of authority |
| viii. | Reality doesn't always match expectation |
| ix. | How the word came into being |
| x. | Illustration of serendipity in the business sector |

27. Paragraph A

Example: Paragraph B

Answer: iii

- 28. Paragraph C
- 29. Paragraph D
- 30. Paragraph E
- 31. Paragraph F
- 32. Paragraph G

SCIENTISTS AND SERENDIPITY

- A.** A paradox lies close to the heart of scientific discovery. If you know just what you are looking for, finding it can hardly count as a discovery, since it was fully anticipated. But if, on the other hand, you have no notion of what you are looking for, you cannot know when you have found it, and discovery, as such, is out of the question. In the philosophy of science, these extremes map onto the purist forms of deductivism and inductivism: In the former, the outcome is supposed to be logically contained in the premises you start with; in the latter, you are recommended to start with no expectations whatsoever and see what turns up.
- B.** As in so many things, the ideal position is widely supposed to reside somewhere in between these two impossible-to-realise extremes. You want to have a good enough idea of what you are looking for to be surprised when you find something else of value, and you want to be ignorant enough

of your end point that you can entertain alternative outcomes. Scientific discovery should, therefore, have an accidental aspect, but not too much of one. Serendip-ity is a word that expresses a position something like that. It's a fascinating word, and the late Robert King Merton—"the father of the sociology of science"—liked it well enough to compose its biography, assisted by the French cultural historian Elinor Barber.

- C. The word did not appear in the published literature until the early 19th century and did not become well enough known to use without explanation until sometime in the first third of the 20th century. Serendipity means a "happy accident" or "pleasant surprise", specifically, the accident of finding something good or useful without looking for it. The first noted use of "serendipity" in the English language was by Horace Walpole. He explained that it came from the fairy tale, called *The Three Princes of Serendip* (the ancient name for Ceylon, or present day Sri Lanka), whose heroes "were always making discoveries, by accidents and sagacity, of things, which they were not in quest of.
- D. Antiquarians, following Walpole, found use for it, as they were always rummaging about for curiosities, and unexpected but pleasant surprises were not unknown to them. Some people just seemed to have a knack for that sort of thing, and serendipity was used to express that special capacity. The other community that came to dwell on serendipity to say something important about their practice was that of scientists, and here usages cut to the heart of the matter and were often vigorously contested. Many scientists, including the Harvard physiologist Walter Cannon and, later, the British immunologist Peter Medawar, liked to emphasise how much of scientific discovery was unplanned and even accidental. One of the examples is Hans Christian Orsted's discovery of electromagnetism when he unintentionally brought a current-carrying wire parallel to a magnetic needle. Rhetoric about the sufficiency of rational method was so much hot air. Indeed, as Medawar insisted, "There is no such thing as The Scientific Method," no way at all of systematising the process of discovery. Really important discoveries had a way of showing up when they had a mind to do so and not when you were looking for them. Maybe some scientists, like some book collectors, had a happy knack; maybe serendipity described the situation rather than a personal skill or capacity.
- E. Some scientists using the word meant to stress those accidents belonging to the situation; some treated serendipity as a personal capacity; many others exploited the ambiguity of the notion. Yet what Cannon and Medawar took as a benign nose-thumbing at Dreams of Method, other scientists found incendiary. To say that science had a significant serendipitous aspect was taken by some as dangerous denigration. If scientific discovery were really accidental, then what was the special basis of expert authority? In this connection, the aphorism of choice came from no less an authority on scientific discovery than Louis Pasteur: "Chance favors the prepared mind." Accidents may happen, and things may turn up unplanned and unforeseen, as one is looking for something else, but the ability to notice such events, to see their potential bearing and meaning,

to exploit their occurrence and make constructive use of them—these are the results of systematic mental preparation. What seems like an accident is just another form of expertise. On closer inspection, it is insisted, accident dissolves into sagacity.

- F. The context in which scientific serendipity was most contested and had its greatest resonance was that connected with the idea of planned science. The serendipitists were not all inhabitants of academic ivory towers. As Merton and Barber note, two of the great early-20th-century American pioneers of industrial research—Willis Whitney and Irving Langmuir, both of General Electric—made much play of serendipity, in the course of arguing against overly rigid research planning. Langmuir thought that misconceptions about the certainty and rationality of the research process did much harm and that a mature acceptance of uncertainty was far more likely to result in productive research policies. For his own part, Langmuir said that satisfactory outcomes "occurred as though we were just drifting with the wind. These things came about by accident." If there is no very determinate relationship between cause and effect in research, he said, then planning does not get us very far." So, from within the bowels of corporate capitalism came powerful arguments, by way of serendipity, for scientific spontaneity and autonomy. The notion that industry was invariably committed to the regimentation of scientific research just doesn't wash.
- G. For Merton himself—who one supposes must have been the senior author—serendipity represented the keystone in the arch of his social scientific work. In 1936, as a very young man, Merton wrote a seminal essay on "The Unanticipated Consequences of Purposive Social Action." It is, he argued, the nature of social action that what one intends is rarely what one gets: Intending to provide resources for buttressing Christian religion, the natural philosophers of the Scientific Revolution laid the groundwork for secularism; people wanting to be alone with nature in Yosemite Valley wind up crowding one another. We just don't know enough—and we can never know enough—to ensure that the past is an adequate guide to the future: Uncertainty about outcomes, even of our best-laid plans, is endemic. All social action, including that undertaken with the best evidence and formulated according to the most rational criteria, is uncertain in its consequences.

Questions 33-37

Choose the correct letter, A, B, C or D. Write the correct letter in boxes 33-37 on your answer sheet.

33. In paragraph A, the word "inductivism" means
- A) anticipate results in the beginning.
 - B) work with prepared premises.
 - C) accept chance discoveries.
 - D) look for what you want.
34. Medawar says "there is no such thing as The Scientific Method" because
- A) discoveries are made by people with determined mind.
 - B) discoveries tend to happen unplanned.
 - C) the process of discovery is unpleasant.
 - D) serendipity is not a skill.
35. Many scientists dislike the idea of serendipity because
- A) it is easily misunderstood and abused.
 - B) it is too unpredictable.
 - C) it is beyond their comprehension.
 - D) it devalues their scientific expertise.
36. The writer mentions Irving Langmuir to illustrate
- A) planned science should be avoided.
 - B) industrial development needs uncertainty.
 - C) people tend to misunderstand the relationship between cause and effect.
 - D) accepting uncertainty can help produce positive results.
37. The example of Yosemite is to show
- A) the conflict between reality and expectation.
 - B) the importance of systematic planning.
 - C) the intention of social action.
 - D) the power of anticipation.

Questions 38-40

Answer the questions below.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer

Write your answers in boxes 38-40 on your answer sheet.

38. Who is the person that first used the word "serendipity"?
39. What kind of story does the word come from?
40. What is the present name of serendipity?

EXAM READING 24

READING PASSAGE 1

ALL ABOUT THE OTTER

- A Otters are semiaquatic (or in the case of the sea otter, aquatic) mammals. They are members of the Mustelid family which includes badgers, polecats, martens, weasels, stoats and minks, and have inhabited the earth for the last 30 million years and over the years have undergone subtle changes to the carnivore bodies to exploit the rich aquatic environment. Otters have long thin body and short legs—ideal for pushing dense undergrowth or hunting in tunnels. An adult male may be up to 4 feet long and 30 pounds. Females are smaller, around 16 pounds typically. The Eurasian otter's nose is about the smallest among the otter species and has a characteristic shape described as a shallow "W". An otter's tail (or rudder, or stern) is stout at the base and tapers towards the tip where it flattens. This forms part of the propulsion unit when swimming fast under water. Otter fur consists of two types of hair: stout guard hairs which form a waterproof outer covering, and under-fur which is dense and fine, equivalent to an otter's thermal underwear. The fur must be kept in good condition by grooming. Sea water reduces the waterproofing and insulating qualities of otter fur when salt water gets in the fur. This is why freshwater pools are important to otters living on the coast. After swimming, they wash the salts off in the pools and then squirm on the ground to rub dry against vegetation.
- B Scent is used for hunting on land, for communication and for detecting danger. Otterine sense of smell is likely to be similar in sensitivity to dogs. Otters have small eyes and are probably short-sighted on land. But they do have the ability to modify the shape of the lens in the eye to make it more spherical, and hence overcome the refraction of water. In clear water and good light, otters can hunt fish by sight. The otter's eyes and nostrils are placed high on its head so that it can see and breathe even when the rest of the body is submerged. The long whiskers growing around the muzzle are used to detect the presence of fish. They detect regular vibrations caused by the beat of the fish's tail as it swims away. This allows otters to hunt even in very murky water. Underwater, the otter holds its legs against the body, except for steering, and the hind end of the body is flexed in a series of vertical undulations. River otters have webbing which extends for much of the length of each digit, though not to the very end. Giant otters and sea otters have even more prominent webs, while the Asian short-clawed otter has no webbing—they hunt for shrimps in ditches and paddy fields so they don't need the swimming speed. Otter ears are protected by valves which close them against water pressure.
- C A number of constraints and preferences limit suitable habitats for otters. Water is a must and the rivers must be large enough to support a healthy population of fish. Being such shy and wary creatures, they will prefer territories where man's activities do not impinge greatly. Of course, there must also be no other otter already in residence—this has only become significant again recently as populations start to recover. A typical range for a male river otter might be 25km of river, a female's range less than half this. However, the productivity of the river affects this hugely

and one study found male ranges between 12 and 80km. Coastal otters have a much more abundant food supply and ranges for males and females may be just a few kilometers of coastline. Because male ranges are usually larger, a male otter may find his range overlaps with two or three females. Otters will eat anything that they can get hold of—there are records of sparrows and snakes and slugs being gobbled. Apart from fish the most common prey are crayfish, crabs and water birds. Small mammals are occasionally taken, most commonly rabbits but sometimes even moles.

- D Eurasian otters will breed any time where food is readily available. In places where condition is more severe, Sweden for example where the lakes are frozen for much of winter, cubs are born in Spring. This ensures that they are well grown before severe weather returns. In the Shetlands, cubs are born in summer when fish is more abundant. Though otters can breed every year, some do not. Again, this depends on food availability. Other factors such as food range and quality of the female may have an effect. Gestation for Eurasian otter is 63 days, with the exception of North American river otter whose embryos may undergo delayed implantation.
- E Otters normally give birth in more secure dens to avoid disturbances. Nests are lined with bedding (reeds, waterside plants, grass) to keep the cubs warm while mummy is away feeding. Litter Size varies between 1 and 5 (2 or 3 being the most common). For some unknown reason, coastal otters tend to produce smaller litters. At five weeks they open their eyes—a tiny cub of 700g. At seven weeks they're weaned onto solid food. At ten weeks they leave the nest, blinking into daylight for the first time. After three months they finally meet the water and learn to swim. After eight months they are hunting, though the mother still provides a lot of food herself. Finally, after nine months she can chase them all away with a clear conscience, and relax—until the next fella shows up.
- F The plight of the British otter was recognised in the early 60s, but it wasn't until the late 70s that the chief cause was discovered. Pesticides, such as dieldrin and aldrin, were first used in 1955 in agriculture and other industries—these chemicals are very persistent and had already been recognised as the cause of huge declines in the population of peregrine falcons, sparrowhawks and other predators. The pesticides entered the river systems and the food chain—micro-organisms, fish and finally otters, with every step increasing the concentration of the chemicals. From 1962 the chemicals were phased out, but while some species recovered quickly, otter numbers did not—and continued to fall into the 80s. This was probably due mainly to habitat destruction and road deaths. Acting on populations fragmented by the sudden decimation in the 50s and 60s, the loss of just a handful of otters in one area can make an entire population unviable and spell the end
- G Otter numbers are recovering all around Britain—imputations are growing again in the few areas where they had remained and have expanded from those areas into the rest of the country. This

is almost entirely due to law and conservation efforts, slowing down and reversing the destruction of suitable otter habitat and reintroductions from captive breeding programs. Releasing captive-bred otters is seen by many as a last resort. The argument runs that where there is no suitable habitat for them they will not survive after release and when there is suitable habitat, natural populations should be able to expand into the area. However, reintroducing animals into a fragmented and fragile population may add just enough impetus for it to stabilise and expand, rather than die out. This is what the Otter Trust accomplished in Norfolk, where the otter population may have been as low as twenty animals at the beginning of the 1980s. The Otter Trust has now finished its captive breeding program entirely. Great news because it means it is no longer needed.

Questions 1-9

Reading Passage 1 has seven paragraphs, A-G. Which paragraph contains the following information? Write the correct letter, A-G, in boxes 1-9 on your answer sheet. NB You may use any letter more than once.

1. A description of how otters regulate vision underwater
2. The fit-for-purpose characteristics of otter's body shape
3. A reference to an underdeveloped sense
4. An explanation of why agriculture failed in otter conservation efforts
5. A description of some of the otter's social characteristics
6. A description of how baby otters grow
7. The conflicted opinions on how to preserve
8. A reference to a legislative act
9. An explanation of how otters compensate for heat loss

Questions 10-13

Answer the questions below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 10-13 on your answer sheet.

10. What skill is not necessary for Asian short-clawed otters?
11. What affects the outer fur of otters?
12. Which type of otters has the shortest range?
13. Which type of mammals do otters hunt occasionally?

READING PASSAGE 2

Questions 14-20

Reading Passage 2 has seven paragraphs, A-G. Choose the most suitable heading for paragraphs A-G from the list of headings below. Write the appropriate number, i-x, in boxes 14-20 on your answer sheet.

List of Headings

- i. The positive correlation between climate and wealth
- ii. Other factors besides climate that influence wealth
- iii. Inspiration from reading a book
- iv. Other researchers' results do not rule out exceptional cases
- v. Different attributes between Eurasia and Africa
- vi. Low temperature benefits people and crops
- vii. The importance of institution in traditional views
- viii. The spread of crops in Europe, Asia and other places
- ix. The best way to use aid
- x. Confusions and exceptions

- 14. Paragraph A
- 15. Paragraph B
- 16. Paragraph C
- 17. Paragraph D
- 18. Paragraph E
- 19. Paragraph F
- 20. Paragraph G

THE RELATION BETWEEN CLIMATE AND WEALTH

Latitude is crucial to a nation's economic strength.

- A Dr William Masters was reading a book about mosquitoes when inspiration struck. "There was this anecdote about the great yellow-fever epidemic that hit Philadelphia in 1793," Masters recalls. "This epidemic decimated the city until the first frost came." The inclement weather froze out the insects, allowing Philadelphia to recover.
- B If weather could be the key to a city's fortunes, Masters thought, then why not to the historical fortunes of nations? And could frost lie at the heart of one of the most enduring economic mysteries of all—why are almost all the wealthy, industrialised nations to be found at latitudes above 40 degrees? After two years of research, he thinks that he has found a piece of the puzzle. Masters, an agricultural economist from Purdue University in Indiana, and Margaret McMillan at Tufts University, Boston, show that annual frosts are among the factors that distinguish rich nations from poor ones. Their study is published this month in the *Journal of Economic Growth*. The pair speculate that cold snaps have two main benefits—they freeze pests that would

otherwise destroy crops, and also freeze organisms, such as mosquitoes, that carry disease. The result is agricultural abundance and a big workforce.

- C The academics took two sets of information. The first was average income for countries, the second climate data from the University of East Anglia. They found a curious tally between the sets. Countries having five or more frosty days a month are uniformly rich, those with fewer than five are impoverished. The authors speculate that the five-day figure is important; it could be the minimum time needed to kill pests in the soil. Masters says: "For example, Finland is a small country that is growing quickly, but Bolivia is a small country that isn't growing at all. Perhaps climate has something to do with that." In fact, limited frosts bring huge benefits to farmers. The chills kill insects or render them inactive; cold weather slows the break-up of plant and animal material in the soil, allowing it to become richer; and frosts ensure a build-up of moisture in the ground for spring, reducing dependence on seasonal rains. There are exceptions to the "cold equals rich" argument. There are well-heeled tropical places such as Hong Kong and Singapore, a result of their superior trading positions. Like-wise, not all European countries are moneyed—in the former communist colonies, economic potential was crushed by politics.
- D Masters stresses that climate will never be the overriding factor—the wealth of nations is too complicated to be attributable to just one factor. Climate, he feels, somehow combines with other factors—such as the presence of institutions, including governments, and access to trading routes—to determine whether a country will do well. Traditionally, Masters says, economists thought that institutions had the biggest effect on the economy, because they brought order to a country in the form of, for example, laws and property rights. With order, so the thinking went, came affluence. "But there are some problems that even countries with institutions have not been able to get around," he says. "My feeling is that, as countries get richer, they get better institutions. And the accumulation of wealth and improvement in governing institutions are both helped by a favourable environment, including climate."
- E This does not mean, he insists, that tropical countries are beyond economic help and destined to remain penniless. Instead, richer countries should change the way in which foreign aid is given. Instead of aid being geared towards improving governance, it should be spent on technology to improve agriculture and to combat disease. Masters cites one example: "There are regions in India that have been provided with irrigation—agricultural productivity has gone up and there has been an improvement in health." Supplying vaccines against tropical diseases and developing crop varieties that can grow in the tropics would break the poverty cycle.
- F Other minds have applied themselves to the split between poor and rich nations, citing anthropological, climatic and zoological reasons for why temperate nations are the most affluent. In 350BC, Aristotle observed that "those who live in a cold climate...are full of spirit". Jared Diamond, from the University of California at Los Angeles, pointed out in his book *Guns, Germs*

and Steel that Eurasia is broadly aligned east-west, while Africa and the Americas are aligned north-south. So, in Europe, crops can spread quickly across latitudes because climates are similar. One of the first domesticated crops, einkorn wheat, spread quickly from the Middle East into Europe; it took twice as long for corn to spread from Mexico to what is now the eastern United States. This easy movement along similar latitudes in Eurasia would also have meant a faster dissemination of other technologies such as the wheel and writing, Diamond speculates. The region also boasted domesticated livestock, which could provide meat, wool and motive power in the fields. Blessed with such natural advantages, Eurasia was bound to take off economically.

- G John Gallup and Jeffrey Sachs, two US economists, have also pointed out striking correlations between the geographical location of countries and their wealth. They note that tropical countries between 23.45 degrees north and south of the equator are nearly all poor. In an article for the *Harvard International Review*, they concluded that "development surely seems to favour the temperate-zone economies, especially those in the northern hemisphere, and those that have managed to avoid both socialism and the ravages of war". But Masters cautions against geographical determinism, the idea that tropical countries are beyond hope: "Human health and agriculture can be made better through scientific and technological research," he says, "so we shouldn't be writing off these countries. Take Singapore: without air conditioning, it wouldn't be rich."

Questions 21-26

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 21-26 on your answer sheet

Dr William Masters read a book saying that a(an) 21 _____ which struck an American city hundreds of years ago was terminated by a cold frost. And academics found that there is a connection between climate and country's wealth as in the rich but small country of 22 _____. Yet besides excellent surroundings and climate, one country still needs to improve their 23 _____ to achieve long prosperity.

Thanks to resembling weather conditions across latitude in the continent of 24 _____, crops such as 25 _____ is bound to spread faster than from South America to the North. Other researchers also noted that even though geographical factors are important, tropical country such as 26 _____ still became rich due to scientific advancement.

READING PASSAGE 3

MUSIC – THE MALADIES AND BENEFITS

Norman M. Weinberger reviews the latest work of Oliver Sacks on music.

Music and the brain are both endlessly fascinating subjects, and as a neuroscientist specialising in auditory learning and memory, I find them especially intriguing. So I had high expectations of *Musicophilia*, the latest offering from neurologist and prolific author Oliver Sacks. And I confess to feeling a little guilty reporting that my reactions to the book are mixed.

Sacks himself is the best part of *Musicophilia*. He richly documents his own life in the book and reveals highly personal experiences. The photograph of him on the cover of the book— which shows him wearing headphones, eyes closed, clearly enchanted as he listens to Alfred Brendel perform Beethoven's *Pathétique* Sonata—makes a positive impression that is borne out by the contents of the book. Sacks's voice throughout is steady and erudite but never pontifical. He is neither self-conscious nor self-promoting.

The preface gives a good idea of what the book will deliver. In it Sacks explains that he wants to convey the insights gleaned from the "enormous and rapidly growing body of work on the neural underpinnings of musical perception and imagery, and the complex and often bizarre disorders to which these are prone." He also stresses the importance of "the simple art of observation" and "the richness of the human context." He wants to combine "observation and description with the latest in technology," he says, and to imaginatively enter into the experience of his patients and subjects. The reader can see that Sacks, who has been practicing neurology for 40 years, is torn between the "old-fashioned" path of observation and the new-fangled, high-tech approach: He knows that he needs to take heed of the latter, but his heart lies with the former.

The book consists mainly of detailed descriptions of cases, most of them involving patients whom Sacks has seen in his practice. Brief discussions of contemporary neuroscientific reports are sprinkled liberally throughout the text. Part I, "Haunted by Music," begins with the strange case of Tony Cicoria, a nonmusical, middle-aged surgeon who was consumed by a love of music after being hit by lightning. He suddenly began to crave listening to piano music, which he had never cared for in the past. He started to play the piano and then to compose music, which arose spontaneously in his mind in a "torrent" of notes. How could this happen? Was the cause psychological? (He had had a near-death experience when the lightning struck him). Or was it the direct result of a change in the auditory regions of his cerebral cortex? Electro-encephalography (EEG) showed his brain waves to be normal in the mid-1990s, just after his trauma and subsequent "conversion" to music. There are now more sensitive tests, but Cicoria has declined to undergo them; he does not want to delve into the causes of his musicality. What a shame!

Part II, "A Range of Musicality," covers a wider variety of topics, but unfortunately, some of the chapters offer little or nothing that is new. For example, chapter 13, which is five pages long,

merely notes that the blind often have better hearing than the sighted. The most interesting chapters are those that present the strangest cases. Chapter 8 is about "amusia," an inability to hear sounds as music, and "dysharmonia," a highly specific impairment of the ability to hear harmony, with the ability to understand melody left intact. Such specific "dissociations" are found throughout the cases Sacks recounts.

To Sacks's credit, part III, "Memory, Movement and Music," brings us into the underappreciated realm of music therapy. Chapter 16 explains how "melodic intonation therapy" is being used to help expressive aphasic patients (those unable to express their thoughts verbally following a stroke or other cerebral incident) once again become capable of fluent speech. In chapter 20, Sacks demonstrates the near-miraculous power of music to animate Parkinson's patients and other people with severe movement disorders, even those who are frozen into odd postures. Scientists cannot yet explain how music achieves this effect.

To readers who are unfamiliar with neuroscience and music behavior, *Musicophilia* may be something of a revelation. But the book will not satisfy those seeking the causes and implications of the phenomena Sacks describes. For one thing, Sacks appears to be more at ease discussing patients than discussing experiments. And he tends to be rather uncritical in accepting scientific findings and theories.

It's true that the causes of music-brain oddities remain poorly understood. However, Sacks could have done more to draw out some of the implications of the careful observations that he and other neurologists have made and of the treatments that have been successful. For example, he might have noted that the many specific dissociations among components of music comprehension, such as loss of the ability to perceive harmony but not melody, indicate that there is no music center in the brain. Because many people who read the book are likely to believe in the brain localisation of all mental functions, this was a missed educational opportunity.

Another conclusion one could draw is that there seem to be no "cures" for neurological problems involving music. A drug can alleviate a symptom in one patient and aggravate it in another, or can have both positive and negative effects in the same patient. Treatments mentioned seem to be almost exclusively antiepileptic medications, which "damp down" the excitability of the brain in general; their effectiveness varies widely.

Finally, in many of the cases described here the patient with music-brain symptoms is reported to have "normal" EEG results. Although Sacks recognises the existence of new technologies, among them far more sensitive ways to analyze brain waves than the standard neurological EEG test, he does not call for their use. In fact, although he exhibits the greatest compassion for patients, he conveys no sense of urgency about the pursuit of new avenues in the diagnosis and treatment of music-brain disorders. This absence echoes the book's preface, in which Sacks

expresses fear that "the simple art of observation may be lost" if we rely too much on new technologies. He does call for both approaches, though, and we can only hope that the neurological community will respond.

Questions 27-30

Choose the correct letter, A, B, C or D.

27. Why does the writer have a mixed feeling about the book?
- A) The guilty feeling made him so.
 - B) The writer expected it to be better than it was.
 - C) Sacks failed to include his personal stories in the book.
 - D) This is the only book written by Sacks.
28. What is the best part of the book?
- A) the photo of Sacks listening to music
 - B) the tone of voice of the book
 - C) the autobiographical description in the book
 - D) the description of Sacks's wealth
29. In the preface, what did Sacks try to achieve?
- A) make terms with the new technologies
 - B) give detailed description of various musical disorders
 - C) explain how people understand music
 - D) explain why he needs to do away with simple observation
30. What is disappointing about Tony Cicoria's case?
- A) He refuses to have further tests.
 - B) He can't determine the cause of his sudden musicality.
 - C) He nearly died because of the lightening.
 - D) His brain waves were too normal to show anything.

Questions 31-36

Do the following statements agree with the views of the writer in Reading Passage 3? In boxes 31-36 on your answer sheet, write

- YES** if the statement agrees with the views of the writer
NO if the statement contradicts with the views of the writer
NOT GIVEN if it is impossible to say what the writer thinks about this

31. It is difficult to give a well-reputable writer a less than favorable review.
32. Beethoven's Pathetique Sonata is a good treatment for musical disorders.
33. Sacks believes technological methods is not important compared with observation when studying his patients.
34. It is difficult to understand why music therapy is undervalued.
35. Sacks should have more skepticism about other theories and findings.
36. Sacks is impatient to use new testing methods.

Questions 37-40

Complete each sentence with the correct ending, A-F, below.

37. The dissociations between harmony and melody
38. The study of treating musical disorders
39. The EEG scans of Sacks's patients
40. Sacks believes testing based on new technologies

- A show no music-brain disorders.
- B indicates that medication can have varied results.
- C is key for the neurological community to unravel the mysteries.
- D should not be used in isolation.
- E indicate that not everyone can receive good education.
- F show that music is not localised in the brain.

EXAM READING 25**READING PASSAGE 1****Questions 1-8**

Reading passage 1 has eight paragraphs, A-H. Choose the correct heading for paragraphs A-H from the list of headings below. Write the correct number, i-xi, in boxes 1-8 on your answer sheet.

List of Headings

- i. The advantage of Morse's invention
- ii. A suitable job for women
- iii. Morse's invention was developed
- iv. Sea rescue after the invention of radiotelegraphy
- v. The emergence of many job opportunities
- vi. Standard and variations
- vii. Application of Morse code in a new technology
- viii. The discovery of electricity
- ix. International expansion of Morse Code
- x. The beginning of an end
- xi. The move of using code to convey information

- 1. Paragraph A
- 2. Paragraph B
- 3. Paragraph C
- 4. Paragraph D
- 5. Paragraph E
- 6. Paragraph F
- 7. Paragraph G
- 8. Paragraph H

THE NOW OBSOLETE - MORSE CODE

Morse code is being replaced by a new satellite-based system for sending distress calls at sea. Its dots and dashes have had a good run for their money.

- A. "Calling all. This is our last cry before our eternal silence." Surprisingly this message, which flashed over the airwaves in the dots and dashes of Morse code on January 31st 1997, was not a desperate transmission by a radio operator on a sinking ship. Rather, it was a message signaling the end of the use of Morse code for distress calls in French waters. Since 1992 countries around the world have been decommissioning their Morse equipment with similar (if less poetic) sign-offs, as the world's shipping switches over to a new satellite-based arrangement, the Global Maritime Distress and Safety System. The final deadline for the switchover to GMDSS is February 1st, a date that is widely seen as the end of an era.
- B. The code has, however, had a good history. Appropriately for a technology commonly associated with radio operators on sinking ships, the idea of Morse code is said to have occurred to Samuel Morse while he was on board a ship crossing the Atlantic. At the time Morse was a painter and occasional inventor, but when another of the ship's passengers informed him of recent advances

in electrical theory, Morse was suddenly taken with the idea of building an electric telegraph to send messages in codes. Other inventors had been trying to do just that for the best part of a century. Morse succeeded and is now remembered as "the father of the telegraph" partly thanks to his single-mindedness—it was 12 years, for example, before he secured money from Congress to build his first telegraph line—but also for technical reasons.

- C. Compared with rival electric telegraph designs, such as the needle telegraph developed by William Cooke and Charles Wheatstone in Britain, Morse's design was very simple: it required little more than a 'key' (essentially, a spring-loaded switch) to send messages, a clicking "sounder" to receive them, and a wire to link the two. But although Morse's hardware was simple, there was a catch: in order to use his equipment, operators had to learn the special code of dots and dashes that still bears his name. Originally, Morse had not intended to use combinations of dots and dashes to represent individual letters. His first code, sketched in his notebook during that transatlantic voyage, used dots and dashes to represent the digits 0 to 9. Morse's idea was that messages would consist of strings of numbers corresponding to words and phrases in a special numbered dictionary. But Morse later abandoned this scheme and, with the help of an associate, Alfred Vail, devised the Morse alphabet, which could be used to spell out messages a letter at a time in dots and dashes.
- D. At first, the need to learn this complicated-looking code made Morse's telegraph seem impossibly tricky compared with other, more user-friendly designs. Cooke's and Wheatstone's telegraph, for example, used five needles to pick out letters on a diamond-shaped grid. But although this meant that anyone could use it, it also required five wires between telegraph stations. Morse's telegraph needed only one. And some people, it soon transpired, had a natural facility for Morse code.
- E. As electric telegraphy took off in the early 1850s, the Morse telegraph quickly became dominant. It was adopted as the European standard in 1851, allowing direct connections between the telegraph networks of different countries. (Britain chose not to participate, sticking with needle telegraphs for a few more years.) By this time Morse code had been revised to allow for accents and other foreign characters, resulting in a split between American and International Morse that continues to this day.
- F. On international submarine cables, left and right swings of a light-beam reflected from a tiny rotating mirror were used to represent dots and dashes. Meanwhile a distinct telegraphic sub-culture was emerging, with its own customs and vocabulary, and a hierarchy based on the speed at which operators could send and receive Morse code. First-class operators, who could send and receive at speeds of up to 45 words a minute, handled press traffic, securing the best-paid jobs in big cities. At the bottom of the pile were slow, inexperienced rural operators, many of whom worked the wires as part-timers. As their Morse code improved, however, rural operators found that their new-found skill was a passport to better pay in a city job. Telegraphers

soon swelled the ranks of the emerging middle classes. Telegraphy was also deemed suitable work for women. By 1870, a third of the operators in the Western Union office in New York, the largest telegraph office in America, were female.

- G. In a dramatic ceremony in 1871, Morse himself said goodbye to the global community of telegraphers he had brought into being. After a lavish banquet and many adulatory speeches, Morse sat down behind an operator's table and, placing his finger on a key connected to every telegraph wire in America, tapped out his final farewell to a standing ovation. By the time of his death in 1872, the world was well and truly wired: more than 650,000 miles of telegraph line and 30,000 miles of submarine cable were throbbing with Morse code; and 20,000 towns and villages were connected to the global network. Just as the Internet is today often called an "information super-highway", the telegraph was described in its day as an "instantaneous highway of thought".
- H. But by the 1890s the Morse telegraphs heyday as a cutting-edge technology was coming to an end, with the invention of the telephone and the rise of automatic telegraphs, precursors of the teleprinter, neither of which required specialist skills to operate. Morse code, however, was about to be given a new lease of life thanks to another new technology: wireless. Following the invention of radiotelegraphy by Guglielmo Marconi in 1896, its potential for use at sea quickly became apparent. For the first time, ships could communicate with each other, and with the shore, whatever the weather and even when out of visual range. In 1897 Marconi successfully sent Morse code messages between a shore station and an Italian warship 19km (12 miles) away. By 1910, Morse radio equipment was commonplace on ships.

Questions 9-13

Do the following statements agree with the information given in Reading Passage 1?

In boxes 9-13 on your answer sheet, write

- | | |
|------------------|--|
| TRUE | if the statement agrees with the information |
| FALSE | if the statement contradicts the information |
| NOT GIVEN | if there is no information on this |

9. Morse had already been famous as an inventor before his invention of Morse code.
10. Morse waited a long time before receiving support from the Congress.
11. Morse code is difficult to learn compared with other designs.
12. Companies and firms prefer to employ telegraphy operators from rural areas.
13. Morse died from overwork.

READING PASSAGE 2

FROM A NOVICE TO AN EXPERT

Expertise is commitment coupled with creativity. Specifically, it is the commitment of time, energy, and resources to a relatively narrow field of study and the creative energy necessary to generate new knowledge in that field. It takes a considerable amount of time and regular exposure to a large number of cases to become an expert.

An individual enters a field of study as a novice. The novice needs to learn the guiding principles and rules of a given task in order to perform that task. Concurrently, the novice needs to be exposed to specific cases, or instances, that test the boundaries of such principles. Generally, a novice will find a mentor to guide her through the process of acquiring new knowledge. A fairly simple example would be someone learning to play chess. The novice chess player seeks a mentor to teach her the object of the game, the number of spaces, the names of the pieces, the function of each piece, how each piece is moved, and the necessary conditions for winning or losing the game.

In time, and with much practice, the novice begins to recognise patterns of behavior within cases and, thus, becomes a journeyman. With more practice and exposure to increasingly complex cases, the journeyman finds patterns not only within cases but also between cases. More importantly, the journeyman learns that these patterns often repeat themselves over time. The journeyman still maintains regular contact with a mentor to solve specific problems and learn more complex strategies. Returning to the example of the chess player, the individual begins to learn patterns of opening moves, offensive and defensive game-playing strategies, and patterns of victory and defeat.

When a journeyman starts to make and test hypotheses about future behavior based on past experiences, she begins the next transition. Once she creatively generates knowledge, rather than simply matching superficial patterns, she becomes an expert. At this point, she is confident in her knowledge and no longer needs a mentor as a guide—she becomes responsible for her own knowledge. In the chess example, once a journeyman begins competing against experts, makes predictions based on patterns, and tests those predictions against actual behavior, she is generating new knowledge and a deeper understanding of the game. She is creating her own cases rather than relying on the cases of others.

The Power of Expertise

An expert perceives meaningful patterns in her domain better than non-experts. Where a novice perceives random or disconnected data points, an expert connects regular patterns within and between cases. This ability to identify patterns is not an innate perceptual skill; rather it reflects the organisation of knowledge after exposure to and experience with thousands of cases. Experts have a deeper understanding of their domains than novices do, and utilise higher-order

principles to solve problems. A novice, for example, might group objects together by color or size, whereas an expert would group the same objects according to their function or utility. Experts comprehend the meaning of data and weigh variables with different criteria within their domains better than novices. Experts recognise variables that have the largest influence on a particular problem and focus their attention on those variables.

Experts have better domain-specific short-term and long-term memory than novices do. Moreover, experts perform tasks in their domains faster than novices and commit fewer errors while problem solving. Interestingly, experts go about solving problems differently than novices. Experts spend more time thinking about a problem to fully understand it at the beginning of a task than do novices, who immediately seek to find a solution. Experts use their knowledge of previous cases as context for creating mental models to solve given problems.

Better at self-monitoring than novices, experts are more aware of instances where they have committed errors or failed to understand a problem. Experts check their solutions more often than novices and recognise when they are missing information necessary for solving a problem. Experts are aware of the limits of their domain knowledge and apply their domain's heuristics to solve problems that fall outside of their experience base.

The Paradox of Expertise

The strengths of expertise can also be weaknesses. Although one would expect experts to be good forecasters, they are not particularly good at making predictions about the future. Since the 1930s, researchers have been testing the ability of experts to make forecasts. The performance of experts has been tested against actuarial tables to determine if they are better at making predictions than simple statistical models. Seventy years later, with more than two hundred experiments in different domains, it is clear that the answer is no. If supplied with an equal amount of data about a particular case, an actuarial table is as good, or better, than an expert at making calls about the future. Even if an expert is given more specific case information than is available to the statistical model, the expert does not tend to outperform the actuarial table.

Theorists and researchers differ when trying to explain why experts are less accurate forecasters than statistical models. Some have argued that experts, like all humans, are inconsistent when using mental models to make predictions. That is, the model an expert uses for predicting X in one month is different from the model used for predicting X in a following month, although precisely the same case and same data set are used in both instances. A number of researchers point to human biases to explain unreliable expert predictions. During the last 30 years, researchers have categorised, experimented, and theorized about the cognitive aspects of forecasting. Despite such efforts, the literature shows little consensus regarding the causes or manifestations of human bias.

Questions 14-18

Complete the flowchart below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 14-18 on your answer sheet.

Novice:

needs 14 _____ and _____ to perform a given task;
exposed to specific cases;
guided by a 15 _____ through learning



Journeyman:

starts to identify 16 _____ within and often exposed to 17 _____ cases;
contacts a mentor when facing difficult problems



Expert:

creates predictions and new 18 _____;
performs task independently without the help of a mentor

Questions 19-23

Do the following statements agree with the information given in Reading Passage 2?

In boxes 19-23 on your answer sheet, write

- TRUE** if the statement agrees with the information
FALSE if the statement contradicts the information
NOT GIVEN if there is no information on this

19. Novices and experts use the same system to classify objects.
20. A novice's training is focused on memory skills.
21. Experts have higher efficiency than novices when solving problems in their own field.
22. When facing a problem, a novices always tries to solve it straight away.
23. Experts are better at recognising their own mistakes and limits.

Questions 24-26

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 24-26 on your answer sheet.

Though experts are quite effective at solving problems in their own domains, their strengths can also be turned against them. Studies have shown that experts are less 24 _____ at making predictions than statistical models. Some researchers theorise it is because experts can also be inconsistent like all others. Yet some believe it is due to 25 _____, but there isn't a great deal of 26 _____ as to its cause and manifestation.

READING PASSAGE 3

HIGH SPEED PHOTOGRAPHY

A Photography gained the interest of many scientists and artists from its inception. Scientists have used photography to record and study movements, such as Eadweard Muybridge's study of human and animal locomotion in 1887. Artists are equally interested by these aspects but also try to explore avenues other than the photo-mechanical representation of reality, such as the pictorialist movement. Military, police, and security forces use photography for surveillance, recognition and data storage. Photography is used by amateurs to preserve memories, to capture special moments, to tell stories, to send messages, and as a source of entertainment. Various technological improvements and techniques have even allowed for visualising events that are too fast or too slow for the human eye.

B One of such techniques is called fast motion or professionally known as time-lapse. Time-lapse photography is the perfect technique for capturing events and movements in the natural world that occur over a timescale too slow for human perception to follow. The life cycle of a mushroom, for example, is incredibly subtle to the human eye. To present its growth in front of audiences, the principle applied is a simple one: a series of photographs are taken and used in sequence to make a moving-image film, but since each frame is taken with a lapse at a time interval between each shot, when played back at normal speed, a continuous action is produced and it appears to speed up. Put simply: we are shrinking time. Objects and events that would normally take several minutes, days or even months can be viewed to completion in seconds having been sped up by factors of tens to millions.

C Another commonly used technique is high-speed photography, the science of taking pictures of very fast phenomena. High-speed photography can be considered to be the opposite of time-lapse photography. One of the many applications is found in biology studies to study birds, bats and even spider silk. Imagine a hummingbird hovering almost completely still in the air, feeding on nectar. With every flap, its wings bend, flex and change shape. These subtle movements precisely control the lift its wings generate, making it an excellent hoverer. But a hummingbird flaps its wings up to 80 times every second. The only way to truly capture this motion is with cameras that will, in effect, slow down time. To do this, a greater length of film is taken at a high sampling frequency or frame rate, which is much faster than it will be projected on screen. When replayed at normal speed, time appears to be slowed down proportionately. That is why high-speed cameras have become such a mainstay of biology.

D In common usage, high-speed photography can also refer to the use of high-speed cameras that the photograph itself may be taken in a way as to appear to freeze the motion, especially to reduce motion blur. It requires a sensor with good sensitivity and either a very good shuttering system or a very fast strobe light. The recent National Geographic footage—captured last summer during an intensive three-day shoot at the Cincinnati Zoo—is unprecedented in its

clarity and detail. "I've watched cheetahs run for 30 years," said Cathryn Hilker, founder of the zoo's Cat Ambassador Program. "But I saw things in that super slow-motion video that I've never seen before." The slow-motion video is entrancing. Every part of the sprinting cat's anatomy—supple limbs, rippling muscles, hyperflexible spine—works together in a symphony of speed, revealing the fluid grace of the world's fastest land animal.

E But things can't get any more complicated in the case of filming a frog catching its prey. Frogs can snatch up prey in a few thousandths of a second—striking out with elastic tongues. Biologists would love to see how a frog's tongue roll out, adhere to prey, and roll back into the frog's mouth. But this all happened too fast, 50 times faster than an eye blink. So naturally people thought of using high-speed camera to capture this fantastic movement in slow motion. Yet one problem still remains—viewers would be bored if they watch the frog swim in slow motion for too long. So how to skip this? The solution is a simple one—adjust the playback speed, which is also called by some the film speed adjustment. The film will originally be shot at a high frame (often 300 frames per second, because it can be converted to much lower frame rates without major issues), but at later editing stage this high frame rate will only be preserved for the prey catching part, while the swimming part will be converted to the normal speed at 24 frames per second. Voila, the scientists can now sit back and enjoy watching without having to go through the pain of waiting.

F Sometimes taking a good picture or shooting a good film is not all about technology, but patience, like in the case of bat. Bats are small, dark-colored; they fly fast and are active only at night. To capture bats on film, one must use some type of camera-tripping device. Photographers or film-makers often place camera near the bat cave, on the path of the flying bats. The camera must be hard-wired with a tripping device so that every time a bat breaks the tripping beam the camera fires and it will keep doing so through the night until the camera's battery runs out. Though highly-advanced tripping device can now allow for unmanned shooting, it still may take several nights to get a truly high quality film.

G Is it science? Is it art? Since the technique was first pioneered around two hundred years ago, photography has developed to a state where it is almost unrecognisable. Some people would even say the future of photography will be nothing like how we imagine it. No matter what future it may hold, photography will continue to develop as it has been repeatedly demonstrated in many aspects of our life that "a picture is worth a thousand words."

Questions 27-30

Look at the following **organisms** (Questions 27-30) and the list of features below.

Match each **organism** with the correct feature, **A-D**. Write the correct letter, **A-D**, in boxes 27-30 on your answer sheet.

- 27. Mushroom
- 28. Hummingbird
- 29. Frog
- 30. Bat

- A too fast to be perceived
- B film at the place where the animal will pass
- C too slow to be visible to human eyes
- D adjust the filming speed to make it interesting

Questions 31-35

Complete the summary below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 31-35 on your answer sheet.

Fast motion (professionally known as time-lapse photography) and slow motion (or high-speed photography) are two commonest techniques of photography. To present before audiences something that occurs naturally slow, photographers take each picture at a 31 _____ before another picture. When these pictures are finally shown on screen in sequence at a normal motion picture rate, audiences see a 32 _____ that is faster than what it naturally is. This technique can make audiences feel as if 33 _____ is shrunk. On the other hand, to demonstrate how fast things move, the movement is exposed on a 34 _____ of film, and then projected on screen at normal playback speed. This makes viewers feel time is 35 _____.

Questions 36 - 40

Reading Passage 3 has seven paragraphs, **A-G**. Which paragraph contains the following information? Write the correct letter, **A-G**, in boxes 36-40 on your answer sheet.

- 36. a description of photography's application in various fields
- 37. a reference to why high-speed photography has a significant role in biology
- 38. a traditional wisdom that assures readers of the prospects of photography
- 39. a reference to how film is processed before final release
- 40. a description of filming shooting without human effort

READING 26

READING PASSAGE 1

THOMAS YOUNG – ONE OF THOSE WHO *KNEW-IT-ALL*

Thomas Young (1773-1829) contributed 63 articles to the Encyclopedia Britannica, including 46 biographical entries (mostly on scientists and classicists) and substantial essays on "Bridge," "Chromatics," "Egypt," "Languages" and "Tides". Was someone who could write authoritatively about so many subjects a polymath, a genius or a dilettante? In an ambitious new biography, Andrew Robinson argues that Young is a good contender for the epitaph "the last man who knew everything." Young has competition, however: The phrase, which Robinson takes for his title, also serves as the subtitle of two other recent biographies: Leonard Warren's 1998 life of paleontologist Joseph Leidy (1823-1891) and Paula Findlen's 2004 book on Athanasius Kircher (1602-1680), another polymath.

Young, of course, did more than write encyclopedia entries. He presented his first paper to the Royal Society of London at the age of 20 and was elected a Fellow a week after his 21st birthday. In the paper, Young explained the process of accommodation in the human eye—on how the eye focuses properly on objects at varying distances. Young hypothesised that this was achieved by changes in the shape of the lens. Young also theorised that light traveled in waves and he believed that, to account for the ability to see in color, there must be three receptors in the eye corresponding to the three "principal colors" to which the retina could respond: red, green, violet. All these hypotheses were subsequently proved to be correct.

Later in his life, when he was in his forties, Young was instrumental in cracking the code that unlocked the unknown script on the Rosetta Stone, a tablet that was "found" in Egypt by the Napoleonic army in 1799. The stone contains text in three alphabets: Greek, something unrecognisable and Egyptian hieroglyphs. The unrecognisable script is now known as demotic and, as Young deduced, is related directly to hieroglyphic. His initial work on this appeared in his Britannica entry on Egypt. In another entry, he coined the term Indo-European to describe the family of languages spoken throughout most of Europe and northern India. These are the landmark achievements of a man who was a child prodigy and who, unlike many remarkable children, did not disappear into oblivion as an adult.

Born in 1773 in Somerset in England, Young lived from an early age with his maternal grandfather, eventually leaving to attend boarding school. He had devoured books from the age of two, and through his own initiative he excelled at Latin, Greek, mathematics and natural philosophy. After leaving school, he was greatly encouraged by his mother's uncle, Richard Brocklesby, a physician and Fellow of the Royal Society. Following Brocklesby's lead, Young decided to pursue a career in medicine. He studied in London, following the medical circuit, and then moved on to more formal education in Edinburgh, Göttingen and Cambridge. After completing his medical training at the University of Cambridge in 1808, Young set up practice as a physician in London. He soon became

a Fellow of the Royal College of Physicians and a few years later was appointed physician at St. George's Hospital.

Young's skill as a physician, however, did not equal his skill as a scholar of natural philosophy or linguistics. Earlier, in 1801, he had been appointed to a professorship of natural philosophy at the Royal Institution, where he delivered as many as 60 lectures in a year. These were published in two volumes in 1807. In 1804 Young had become secretary to the Royal Society, a post he would hold until his death. His opinions were sought on civic and national matters, such as the introduction of gas lighting to London and methods of ship construction. From 1819 he was superintendent of the Nautical Almanac and secretary to the Board of Longitude. From 1824 to 1829 he was physician to and inspector of calculations for the Palladian Insurance Company. Between 1816 and 1825 he contributed his many and various entries to the *Encyclopedia Britannica*, and throughout his career he authored numerous books, essays and papers.

Young is a perfect subject for a biography — perfect, but daunting. Few men contributed so much to so many technical fields. Robinson's aim is to introduce non-scientists to Young's work and life. He succeeds, providing clear expositions of the technical material (especially that on optics and Egyptian hieroglyphs). Some readers of this book will, like Robinson, find Young's accomplishments impressive; others will see him as some historians have—as a dilettante. Yet despite the rich material presented in this book, readers will not end up knowing Young personally. We catch glimpses of a playful Young, doodling Greek and Latin phrases in his notes on medical lectures and translating the verses that a young lady had written on the walls of a summerhouse into Greek elegiacs. Young was introduced into elite society, attended the theatre and learned to dance and play the flute. In addition, he was an accomplished horseman. However, his personal life looks pale next to his vibrant career and studies.

Young married Eliza Maxwell in 1804, and according to Robinson, "their marriage was a happy one and she appreciated his work." Almost all we know about her is that she sustained her husband through some rancorous disputes about optics and that she worried about money when his medical career was slow to take off. Very little evidence survives about the complexities of Young's relationships with his mother and father. Robinson does not credit them, or anyone else, with shaping Young's extraordinary mind. Despite the lack of details concerning Young's relationships, however, anyone interested in what it means to be a genius should read this book.

Questions 1-7

Do the following statements agree with the information given in Reading Passage 1? Write

TRUE if the statement agrees with the information

FALSE if the statement contradicts the information

NOT GIVEN if there is no information on this

1. 'The last man who knew everything' has also been claimed to other people.
2. All Young's articles were published in *Encyclopedia Britannica*.
3. Like others, Young wasn't so brilliant when growing up.
4. Young's talent as a doctor surpassed his other skills.
5. Young's advice was sought by people responsible for local and national issues.
6. Young was interested in various social pastimes.
7. Young suffered from a disease in his later years.

Questions 8-13

Answer the questions below. Choose **NO MORE THAN THREE WORDS AND/OR A NUMBER** from the passage for each answer.

8. How many life stories did Young write for the *Encyclopedia Britannica*?
9. What aspect of scientific research did Young focus on in his first academic paper?
10. What name did Young introduce to refer to a group of languages?
11. Who inspired Young to start his medical studies?
12. Where did Young get a teaching position?
13. What contribution did Young make to London?

READING PASSAGE 2

ANTARCTICA – AS PERCEIVED IN THE 21ST CENTURY

- A. A little over a century ago, men of the ilk of Scott, Shackleton and Mawson battled against Antarctica's blizzards, cold and deprivation. In the name of Empire and in an age of heroic deeds they created an image of Antarctica that was to last well into the 20th century—an image of remoteness, hardship, bleakness and isolation that was the province of only the most courageous of men. The image was one of a place removed from everyday reality, of a place with no apparent value to anyone.
- B. As we enter the 21st century, our perception of Antarctica has changed. Although physically Antarctica is no closer and probably no warmer, and to spend time there still demands a dedication not seen in ordinary life, the continent and its surrounding ocean are increasingly seen to be an integral part of Planet Earth, and a key component in the Earth System. Is this because the world seems a little smaller these days, shrunk by TV and tourism, or is it because Antarctica really does occupy a central spot on Earth's mantle? Scientific research during the past half century has revealed—and continues to reveal—that Antarctica's great mass and low

temperature exert a major influence on climate and ocean circulation, factors which influence the lives of millions of people all over the globe.

- C. Antarctica was not always cold. The slow break-up of the super-continent Gondwana with the northward movements of Africa, South America, India and Australia eventually created enough space around Antarctica for the development of an Antarctic Circumpolar Current (ACC), that flowed from west to east under the influence of the prevailing westerly winds. Antarctica cooled, its vegetation perished, glaciation began and the continent took on its present-day appearance. Today the ice that overlies the bedrock is up to 4km thick, and surface temperatures as low as -89.2deg C have been recorded. The icy blast that howls over the ice cap and out to sea—the so-called katabatic wind—can reach 300 km/hr, creating fearsome wind-chill effects.
- D. Out of this extreme environment come some powerful forces that reverberate around the world. The Earth's rotation, coupled to the generation of cells of low pressure off the Antarctic coast, would allow Astronauts a view of Antarctica that is as beautiful as it is awesome. Spinning away to the northeast, the cells grow and deepen, whipping up the Southern Ocean into the mountainous seas so respected by mariners. Recent work is showing that the temperature of the ocean may be a better predictor of rainfall in Australia than is the pressure difference between Darwin and Tahiti—the Southern Oscillation Index. By receiving more accurate predictions, graziers in northern Queensland are able to avoid overstocking in years when rainfall will be poor. Not only does this limit their losses but it prevents serious pasture degradation that may take decades to repair. CSIRO is developing this as a prototype forecasting system, but we can confidently predict that as we know more about the Antarctic and Southern Ocean we will be able to enhance and extend our predictive ability.
- E. The ocean's surface temperature results from the interplay between deep-water temperature, air temperature and ice. Each winter between 4 and 19 million square km of sea ice form, locking up huge quantities of heat close to the continent. Only now can we start to unravel the influence of sea ice on the weather that is experienced in southern Australia. But in another way the extent of sea ice extends its influence far beyond Antarctica. Antarctic krill—the small shrimp-like crustaceans that are the staple diet for baleen whales, penguins, some seals, flighted sea birds and many fish—breed well in years when sea ice is extensive and poorly when it is not. Many species of baleen whales and flighted sea birds migrate between the hemispheres and when the krill are less abundant they do not thrive.
- F. The circulatory system of the world's oceans is like a huge conveyor belt, moving water and dissolved minerals and nutrients from one hemisphere to the other, and from the ocean's abyssal depths to the surface. The ACC is the longest current in the world, and has the largest flow. Through it, the deep flows of the Atlantic, Indian and Pacific Oceans are joined to form part of a single global thermohaline circulation. During winter, the howling katabatics sometimes scour the

ice off patches of the sea's surface leaving large ice-locked lagoons, or 'polynyas'. Recent research has shown that as fresh sea ice forms, it is continuously stripped away by the wind and may be blown up to 90km in a single day. Since only fresh water freezes into ice, the water that remains becomes increasingly salty and dense, sinking until it spills over the continental shelf. Cold water carries more oxygen than warm water, so when it rises, well into the northern hemisphere, it reoxygenates and revitalises the ocean. The state of the northern oceans, and their biological productivity, owe much to what happens in the Antarctic.

Questions 14-18

Reading Passage 2 has six paragraphs, A-F. Which paragraph contains the following information? Write the correct letter, A-F, in boxes 14-18 on your answer sheet.

14. The example of a research on building weather prediction for agriculture
15. An explanation of how Antarctic sea ice brings back oceans' vitality
16. The description of a food chain that influences animals living pattern
17. The reference of an extreme temperature and a cold wind in Antarctica
18. The reference of how Antarctica was once thought to be a forgotten and insignificant continent

Questions 19-21

Match the natural phenomenon with the correct determined factor. Write the correct letter, A-F, in boxes 19-21 on your answer sheet.

- 19 Globally, Antarctica's massive size and _____ would influence our climate.
- 20 _____ circulated under contributory force from wind blowing from the west.
- 21 The ocean temperature and index based on air pressure can help predict _____ in Australia.

- A Antarctic Circumpolar Current (ACC)
- B katabatic winds
- C rainfall
- D temperature
- E glaciers
- F pressure

Questions 22-26

Choose the correct letter, A, B, C or D. Write the correct letter in boxes 22-26 on your answer sheet.

22. In paragraph B, the author intends to
- A) show Antarctica has been a central topic of global warming discussion in Mass media.
 - B) illustrate how its huge sea ice brings food to millions of lives in the world.
 - C) emphasise the significance of Antarctica to the global climate and ocean currents.
 - D) illustrate the geographical location of Antarctica as the central spot on Earth.
23. Why should Australian farmers keep an eye on the Antarctic ocean temperature?
- A) It can help farmers reduce their economic loss.
 - B) It allows for recovery of grassland lost to overgrazing.
 - C) It can help to prevent animals from dying
 - D) It enables astronauts to have a clear view of the Antarctic continent.
24. The decrease in the number of whales and seabirds is due to
- A) killer whales' activity around Antarctica.
 - B) the correlation between sea birds' migration and the salinity level of the ocean.
 - C) the lower productivity of food source resulting from less sea ice.
 - D) the failure of seals to produce babies.
25. What is the final effect of the katabatic winds?
- A) Increasing the moving speed of ocean current
 - B) Increasing the salt level near ocean surface
 - C) Bringing fresh ice into the oceans
 - D) Piling up the mountainous ice cap respected by mariners
26. What factor drives Antarctic water to move beyond the continental shelf?
- A) The increase of salt and density of the water
 - B) The decrease of salt and density of the water
 - C) The rising temperature due to global warming
 - D) The melting of fresh ice into the ocean

READING PASSAGE 3

KNOWLEDGE AND ITS SOURCES

- A What counts as knowledge? What do we mean when we say that we know something? What is the status of different kinds of knowledge? In order to explore these questions we are going to focus on one particular area of knowledge— medicine.
- B How do you know when you are ill? This may seem to be an absurd question. You know you are ill because you feel ill; your body tells you that you are ill. You may know that you feel pain or discomfort but knowing you are ill is a bit more complex. At times, people experience the symptoms of illness, but in fact they are simply tired or over-worked or they may just have a hangover. At other times, people may be suffering from a disease and fail to be aware of the illness until it has reached a late stage in its development. So how do we know we are ill, and what counts as knowledge?
- C Think about this example. You feel unwell. You have a bad cough and always seem to be tired. Perhaps it could be stress at work, or maybe you should give up smoking. You feel worse. You visit the doctor who listens to your chest and heart, takes your temperature and blood pressure, and then finally prescribes antibiotics for your cough.
- D Things do not improve but you struggle on thinking you should pull yourself together, perhaps things will ease off at work soon. A return visit to your doctor shocks you. This time the doctor, drawing on years of training and experience, diagnoses pneumonia. This means that you will need bed rest and a considerable time off work. The scenario is transformed. Although you still have the same symptoms, you no longer think that these are caused by pressure at work. You now have proof that you are ill. This is the result of the combination of your own subjective experience and the diagnosis of someone who has the status of a medical expert. You have a medically authenticated diagnosis and it appears that you are seriously ill; you know you are ill and have evidence upon which to base this knowledge.
- E This scenario shows many different sources of knowledge. For example, you decide to consult the doctor in the first place because you feel unwell—this is personal knowledge about your own body. However, the doctor's expert diagnosis is based on experience and training, with sources of knowledge as diverse as other experts, laboratory reports, medical textbooks and years of experience.
- F One source of knowledge is the experience of our own bodies; the personal knowledge we have of changes that might be significant, as well as the subjective experience of pain and physical distress. These experiences are mediated by other forms of knowledge such as the words we have available to describe our experience and the common sense of our families and friends as well as that drawn from popular culture. Over the past decade, for example, Western culture has seen a

significant emphasis on stress-related illness in the media. Reference to being 'stressed out' has become a common response in daily exchanges in the workplace and has become part of popular common-sense knowledge. It is thus not surprising that we might seek such an explanation of physical symptoms of discomfort.

- G We might also rely on the observations of others who know us. Comments from friends and family such as 'you do look ill' or 'that's a bad cough' might be another source of knowledge. Complementary health practices, such as holistic medicine, produce their own sets of knowledge upon which we might also draw in deciding the nature and degree of our ill health and about possible treatments.
- H Perhaps the most influential and authoritative source of knowledge is the medical knowledge provided by the general practitioner. We expect the doctor to have access to expert knowledge. This is socially sanctioned. It would not be acceptable to notify our employer that we simply felt too unwell to turn up for work or that our faith healer, astrologer, therapist or even our priest thought it was not a good idea. We need an expert medical diagnosis in order to obtain the necessary certificate if we need to be off work for more than the statutory self-certification period. The knowledge of the medical sciences is privileged in this respect in contemporary Western culture. Medical practitioners are also seen as having the required expert knowledge that permits them legally to prescribe drugs and treatment to which patients would not otherwise have access. However there is a range of different knowledge upon which we draw when making decisions about our own state of health.
- I However, there is more than existing knowledge in this little story; new knowledge is constructed within it. Given the doctor's medical training and background, she may hypothesise 'is this now pneumonia?' and then proceed to look for evidence about it. She will use observations and instruments to assess the evidence and—critically—interpret it in the light of her training and experience. This results in new knowledge and new experience both for you and for the doctor. This will then be added to the doctor's medical knowledge and may help in future diagnosis of pneumonia.

Questions 27-34

Reading Passage 3 has nine paragraphs, **A-I**. Which paragraph contains the following information? Write the correct letter, **A-I**, in boxes 27-34 on your answer sheet. **NB** You may use any letter more than once.

27. the contrast between the nature of personal judgment and the nature of doctor's diagnosis
28. a reference of culture about pressure
29. sick leave will not be permitted without professional diagnosis
30. how doctors' opinions are regarded in the society
31. the illness of patients can become part of new knowledge
32. a description of knowledge drawn from non-specialised sources other than personal knowledge
33. an example of collective judgment from personal experience and professional doctor
34. a reference that some people do not realise they are ill

Questions 35-40

Complete the notes below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 35-40 on your answer sheet.

Source of Knowledge	Examples
Personal Experience	Symptoms of a 35..... and tiredness Doctor's measurement by taking 36..... and temperature Common judgment from 37..... around you
Scientific evidence	Medical knowledge from the general 38..... e.g. doctor's medical 39..... Examine the medical hypothesis with the previous drill and 40.....

READING 27**PASSAGE 1****NON-PESTICIDE MANAGEMENT OF CROPS IN INDIA**

- A.** A dramatic story about cotton farmers in India shows how destructive pesticides can be for people and the environment; and why today's agriculture is so dependent on pesticides. This story also shows that it's possible to stop using chemical pesticides without losing a crop to ravaging insects, and it explains how to do it.
- B.** The story began about 30 years ago, a handful of families migrated from the Guntur district of Andhra Pradesh, southeast India, into Punukula, a community of around 900 people farming plots of between two and 10 acres. The outsiders from Guntur brought cotton-culture with them. Cotton wooed farmers by promising to bring in more hard cash than the mixed crops they were already growing to eat and sell: millet, sorghum, groundnuts, pigeon peas, mung beans, chilli and rice. But raising cotton meant using pesticides and fertilisers - until then a mystery to the mostly illiterate farmers of the community. When cotton production started spreading through Andhra Pradesh state. The high value of cotton made it an exceptionally attractive crop, but growing cotton required chemical fertilizers and pesticides. As most of the farmers were poor, illiterate, and without previous experience using agricultural chemicals, they were forced to rely on local, small-scale agricultural dealers for advice. The dealers sold them seeds, fertilizers, and pesticides on credit and also guaranteed purchase of their crop. The dealers themselves had little technical knowledge about pesticides. They merely passed on promotional information from multinational chemical companies that supplied their products.
- C.** At first, cotton yields were high, and expenses for pesticides were low because cotton pests had not yet moved in. The farmers had never earned so much! But within a few years, cotton pests like bollworms and aphids plagued the fields, and the farmers saw how rapid insect evolution can be. Repeated spraying killed off the weaker pests, but left the ones most resistant to pesticides to multiply. As pesticide resistance mounted, the farmers had to apply more and more of the pesticides to get the same results. At the same time, the pesticides killed off birds, wasps, beetles, spiders, and other predators that had once provided natural control of pest insects. Without these predators, the pests could destroy the entire crop if pesticides were not used. Eventually, farmers were mixing pesticide "cocktails" containing as many as ten different brands and sometimes having to spray their cotton as frequently as two times a week. They were really hooked!
- D.** The villagers were hesitant, but one of Punukula's village elders decided to risk trying the natural methods instead of pesticides. His son had collapsed with acute pesticide poisoning and survived but the hospital bill was staggering. SECURE's staff coached this villager on how to protect his cotton crop by using a toolkit of natural methods that India's Center for Sustainable Agriculture put together in collaboration with scientists at Andhra Pradesh's state university. They called the toolkit "Non-Pesticide Management" or "NPM."

- E. The most important resource in the NPM toolkit was the neem tree (*Azadirachta indica*), which is common throughout much of India. Neem tree is a broad-leaved evergreen tree related to mahogany. It protects itself against insects by producing a multitude of natural pesticides that work in a variety of ways: with an arsenal of chemical defenses that repel egg-laying, interfere with insect growth, and most important, disrupt the ability of crop-eating insects to sense their food.
- F. In fact, neem has been used traditionally in India to protect stored grains from insects and to produce soaps, skin lotions, and other health products. To protect crops from insects, neem seeds are simply ground into a powder that is soaked overnight in water. The solution is then sprayed onto the crop. Another preparation, neem cake, can be mixed into the soil to kill pests and diseases in the soil, and it doubles as an organic fertiliser high in nitrogen. Neem trees grow locally, so the only "cost" is the labor to prepare neem for application to fields.
- G. The first farmer's trial with NPM was a complete success! His harvest was as good as the harvests of farmers that were using pesticides, and he earned much more because he did not spend a single rupee on pesticides. Inspired by this success, 20 farmers tried NPM the next year. SECURE posted two well-trained staff in Punukula to teach and help everyone in the village, and the village women put pressure on their husbands to stop using toxic chemicals. Families that were no longer exposing themselves to pesticides began to feel much better, and the rapid improvements in income, health, and general wellbeing quickly sold everyone on the value of NPM. By 2000, all the farmers in Punukula were using NPM, not only for cotton, but for their other crops as well.
- H. The suicide epidemic came to an end. And with the cash, health, and energy that returned when they stopped poisoning themselves with pesticides, the villagers were inspired to start more community and business projects. The women of Punukula created a new source of income by collecting, grinding, and selling neem seeds for NPM in other villages. The villagers rescued their indentured children and gave them special six-month "catch-up" courses to return to school.
- I. Fighting against pesticides, and winning, increased village solidarity, self-confidence, and optimism about the future. When dealers tried to punish NPM users by paying less for NPM cotton, the farmers united to form a marketing cooperative that found fairer prices elsewhere. The leadership and collaboration skills that the citizens of Punukula developed in the NPM struggle have helped them to take on other challenges, like water purification, building a cotton gin to add value to the cotton before they sell it, and convincing the state government to support NPM over the objection of multi-national pesticide corporations.

Questions 1 -4

Do the following statements agree with the information given in Reading Passage 1? Write

TRUE	if the statement is true
FALSE	if the statement is false
NOT GIVEN	if the information is not given in the passage

1. Cotton in Andhra Pradesh state could really bring more income to the local farmers than traditional farming.
2. The majority of farmers had used the agricultural pesticides before 30 years ago.
3. The yield of cotton is relatively lower than that of other agricultural crops.
4. The farmers didn't realize the spread of the pests was so fast.

Questions 5-11

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 5-10 on your answer sheet.

The Making of pesticide protecting crops against insects

The broad-leaved neem tree was chosen, it is a fast-growing and 5_____ tree and produces amount of 6_____ for itself that can be effective like insects repellent. Firstly, neem seeds need to be crushed into 7_____ form, which is left behind 8_____ in water. Then we need to spray the solution onto the crop. A special 9_____ is used when mix with soil in order to eliminate bugs and bacteria, and its effect 10_____ when it adds the level of 11_____ in this organic fertilizer meanwhile.

Questions 12-14

Answer the questions below. Choose **NO MORE THAN TWO WORDS AND/OR A NUMBER** from the passage for each answer Write your answers in boxes 12-14 on your answer sheet.

12. In which year did all the farmers use NPM for their crops in Punukula?
13. What gave the women of Punukula a business opportunity to NPMs?
14. Name one project that the citizens of Punukula decide to develop in the NPM.

PASSAGE 2

NUMERACY IN ANIMALS

A Prime among basic numerical faculties is the ability to distinguish between a larger and a smaller number, says psychologist Elizabeth Brannon. Humans can do this with ease -providing the ratio is big enough - but do other animals share this ability? In one experiment, rhesus monkeys and university students examined two sets of geometrical objects that appeared briefly on a computer monitor. They had to decide which set contained more objects. Both groups performed successfully but, importantly, Brannon's team found that monkeys, like humans, make more errors when two sets of objects are close in number. The students' performance ends up looking just like a monkey's. It's practically identical, 'she says.

B Humans and monkeys are mammals, in the animal family known as primates. These are not the only animals whose numerical capacities rely on ratio, however. The same seems to apply to some amphibians. Psychologist Claudia Uller's team tempted salamanders with two sets of fruit flies held in clear tubes. In a series of trials, the researchers noted which tube the salamanders scampered towards, reasoning that if they had a capacity to recognise number, they would head for the larger number. The salamanders successfully discriminated between tubes containing 8 and 16 flies respectively, but not between 3 and 4, 4 and 6, or 8 and 12. So it seems that for the salamanders to discriminate between two numbers, the larger must be at least twice as big as the smaller. However, they could differentiate between 2 and 3 flies just as well as between 1 and 2 flies, suggesting they recognise small numbers in a different way from larger numbers.

C Further support for this theory comes from studies of mosquitofish, which instinctively join the biggest shoal they can. A team at the University of Padova found that while mosquitofish can tell the difference between a group containing 3 shoal-mates and a group containing 4, they did not show a preference between groups of 4 and 5. The team also found that mosquitofish can discriminate between numbers up to 16, but only if the ratio between the fish in each shoal was greater than 2:1. This indicates that the fish, like salamanders, possess both the approximate and precise number systems found in more intelligent animals such as infant humans and other primates.

D While these findings are highly suggestive, some critics argue that the animals might be relying on other factors to complete the tasks, without considering the number itself. 'Any study that's claiming an animal is capable of representing number should also be controlling for other factors,' says Brannon. Experiments have confirmed that primates can indeed perform numerical feats without extra clues, but what about the more primitive animals?

E To consider this possibility, the mosquito fish tests were repeated, this time using varying geometrical shapes in place of fish. The team arranged these shapes so that they had the same overall surface area and luminance even though they contained a different number of objects.

Across hundreds of trials on 14 different fish, the team found they consistently discriminated 2 objects from 3. The team is now testing whether mosquitofish can also distinguish 3 geometric objects from 4.

F Even more primitive organisms may share this ability. Entomologist Jurgen Tautz sent a group of bees down a corridor, at the end of which lay two chambers - one which contained sugar water, which they like, while the other was empty. To test the bees' numeracy, the team marked each chamber with a different number of geometrical shapes - between 2 and 6. The bees quickly learned to match the number of shapes with the correct chamber. Like the salamanders and fish, there was a limit to the bees' mathematical prowess - they could differentiate up to 4 shapes, but failed with 5 or 6 shapes.

G These studies still do not show whether animals learn to count through training, or whether they are born with the skills already intact. If the latter is true, it would suggest there was a strong evolutionary advantage to a mathematical mind. Proof that this may be the case has emerged from an experiment testing the mathematical ability of three- and four-day-old chicks. Like mosquitofish, chicks prefer to be around as many of their siblings as possible, so they will always head towards a larger number of their kin. If chicks spend their first few days surrounded by certain objects, they become attached to these objects as if they were family. Researchers placed each chick in the middle of a platform and showed it two groups of balls of paper. Next, they hid the two piles behind screens, changed the quantities and revealed them to the chick. This forced the chick to perform simple computations to decide which side now contained the biggest number of its "brothers". Without any prior coaching, the chicks scuttled to the larger quantity at a rate well above chance. They were doing some very simple arithmetic, claim the researchers.

H Why these skills evolved is not hard to imagine, since it would help almost any animal forage for food. Animals on the prowl for sustenance must constantly decide which tree has the most fruit, or which patch of flowers will contain the most nectar. There are also other, less obvious, advantages of numeracy. In one compelling example, researchers in America found that female coots appear to calculate how many eggs they have laid - and add any in the nest laid by an intruder - before making any decisions about adding to them. Exactly how ancient these skills are is difficult to determine, however. Only by studying the numerical abilities of more and more creatures using standardized procedures can we hope to understand the basic preconditions for the evolution of number.

Questions 15-21

Answer the table below. Choose **NO MORE THAN THREE WORDS AND/OR A NUMBER** from the passage for each answer. Write your answers in boxes 15-21 on your answer sheet

Animal Numeracy		
Subjects	Experiments	Results
Mammals and Birds		
Rhesus monkeys and humans	Looked at two sets of geometrical objects on computer screen	Performance of two groups is almost 15 _____
Chicks	Chose between two sets of 16 _____ which are altered	Chicks can do calculations in order to choose larger group
Coots	Behavior of female birds was observed	Bird seems to have ability to 17 _____
Amphibians, fish and insects		
Salamanders	Offered clear tubes containing different quantities of 18 _____	Salamanders distinguish between numbers over four if bigger number is at least two times larger
19 _____	Show real shoals and later artificial ones of geometrical shapes; these are used to check influence of total 20 _____ and brightness	Subjects know difference between two and three and possibly three and four, but not between four and five
Bees	Had to learn where 21 _____ was stored	Could soon choose correct place

Questions 22-27

Do the following statements agree with the information given in Reading Passage 2? In boxes 22-27 on your answer sheet, write

- TRUE** if the statement is true
FALSE if the statement is false
NOT GIVEN if the information is not given in the passage

22. Primates are better at identifying the larger of two numbers if one is much bigger than the other.

23. Jurgen Tautz trained the insects in his experiment to recognise the shapes of individual numbers.

24. The research involving young chicks took place over two separate days.
25. The experiment with chicks suggests that some numerical ability exists in newborn animals.
26. Researchers have experimented by altering quantities of nectar or fruit available to certain wild animals.
27. When assessing the number of eggs in their nest, coots take into account those of other birds.

PASSAGE 3

MULTITASKING DEBATE IS TRUE MULTITASKING POSSIBLE?

A Talking on the phone while driving isn't the only situation where we're worse at multitasking than we might like to think we are. New studies have identified a bottleneck in our brains that some say means we are fundamentally incapable of true multitasking. If experimental findings reflect real-world performance, people who think they are multitasking are probably just underperforming in all - or at best, all but one - of their parallel pursuits. Practice might improve your performance, but you will never be as good as when focusing on one task at a time.

B The problem, according to Rene Marois, a psychologist at Vanderbilt University in Nashville, Tennessee, is that there's a sticking point in the brain. To demonstrate this, Marois devised an experiment to locate it. Volunteers watch a screen and when a particular image appears, a red circle, say, they have to press a key with their index finger. Different coloured circles require presses from different fingers. Typical response time is about half a second, and the volunteers quickly reach their peak performance. Then they learn to listen to different recordings and respond by making a specific sound. For instance, when they hear a bird chirp, they have to say "ba"; an electronic sound should elicit a "ko", and so on. Again, no problem. A normal person can do that in about half a second, with almost no effort.

C The trouble comes when Marois shows the volunteers an image, and then almost immediately plays them a sound. Now they're flummoxed. "If you show an image and play a sound at the same time, one task is postponed," he says. In fact, if the second task is introduced within the half-second or so it takes to process and react to the first, it will simply be delayed until the first one is done. The largest dual-task delays occur when the two tasks are presented simultaneously; delays progressively shorten as the interval between presenting the tasks lengthens.

D There are at least three points where we seem to get stuck, says Marois. The first is in simply identifying what we're looking at. This can take a few tenths of a second, during which time we are not able to see and recognise the second item. This limitation is known as the

"attentional blink": experiments have shown that if you're watching out for a particular event and a second one shows up unexpectedly any time within this crucial window of concentration, it may register in your visual cortex but you will be unable to act upon it. Interestingly, if you don't expect the first event, you have no trouble responding to the second. What exactly causes the attentional blink is still a matter for debate.

E A second limitation is in our short-term visual memory. It's estimated that we can keep track of about four items at a time, fewer if they are complex. This capacity shortage is thought to explain, in part, our astonishing inability to detect even huge changes in scenes that are otherwise identical, so-called "change blindness". Show people pairs of near-identical photos - say, aircraft engines in one picture have disappeared in the other - and they will fail to spot the differences. Here again, though, there is disagreement about what the essential limiting factor really is. Does it come down to a dearth of storage capacity, or is it about how much attention a viewer is paying?

F A third limitation is that choosing a response to a stimulus - braking when you see a child in the road, for instance, or replying when your mother tells you over the phone that she's thinking of leaving your dad - also takes brainpower. Selecting a response to one of these things will delay by some tenths of a second your ability to respond to the other. This is called the "response selection bottleneck" theory, first proposed in 1952.

G But David Meyer, a psychologist at the University of Michigan, Ann Arbor, doesn't buy the bottleneck idea. He thinks dual-task interference is just evidence of a strategy used by the brain to prioritise multiple activities. Meyer is known as something of an optimist by his peers. He has written papers with titles like "Virtually perfect time-sharing in dual-task performance: Uncorking the central cognitive bottleneck". His experiments have shown that with enough practice - at least 2000 tries - some people can execute two tasks simultaneously as competently as if they were doing them one after the other. He suggests that there is a central cognitive processor that coordinates all this and, what's more, he thinks it uses discretion sometimes - it chooses to delay one task while completing another.

H Marois agrees that practice can sometimes erase interference effects. He has found that with just 1 hour of practice each day for two weeks, volunteers show a huge improvement at managing both his tasks at once. Where he disagrees with Meyer is in what the brain is doing to achieve this. Marois speculates that practice might give us the chance to find less congested circuits to execute a task - rather like finding trusty back streets to avoid heavy traffic on main roads - effectively making our response to the task subconscious. After all, there are plenty of examples of subconscious multitasking that most of us routinely manage: walking and talking, eating and reading, watching TV and folding the laundry.

I It probably comes as no surprise that, generally speaking, we get worse at multitasking as we age. According to Art Kramer at the University of Illinois at Urbana-Champaign, who studies how ageing affects our cognitive abilities, we peak in our 20s. Though the decline is slow through our 30s and on into our 50s, it is there; and after 55, it becomes more precipitous. In one study, he and his colleagues had both young and old participants do a simulated driving task while carrying on a conversation. He found that while young drivers tended to miss background changes, older drivers failed to notice things that were highly relevant. Likewise, older subjects had more trouble paying attention to the more important parts of a scene than young drivers.

J It's not all bad news for over-55s, though. Kramer also found that older people can benefit from practice. Not only did they learn to perform better, brain scans showed that underlying that improvement was a change in the way their brains become active. While it's clear that practice can often make a difference, especially as we age, the basic facts remain sobering. "We have this impression of an almighty complex brain," says Marois, "and yet we have very humbling and crippling limits." For most of our history, we probably never needed to do more than one thing at a time, he says, and so we haven't evolved to be able to. Perhaps we will in future, though. We might yet look back one day on people like Debbie and Alun as ancestors of a new breed of true multitasker.

Questions 28-32

The reading Passage has ten paragraphs A-J. Which paragraph contains the following information? Write the correct letter in boxes 28-32 on your answer sheet.

28. A theory explained delay happens when selecting one reaction.
29. Different age groups respond to important things differently.
30. Conflicts happened when visual and audio elements emerge simultaneously.
31. An experiment designed to demonstrates the critical part in brain for multitasking.
32. A viewpoint favors optimistic side of multitask performance.

Questions 33-35

Choose the correct letter, **A, B, C** or **D**. Write your answers in boxes 33-35 on your answer sheet.

- 33 Which one is correct about experiment conducted by Rene Marois?
- A) participants performed poorly on listening task solely
 - B) volunteers press different key on different color
 - C) participants need use different fingers on different colored object
 - D) they did a better job on mixed image and sound information
- 34 Which statement is correct about the first limitation of Marois's experiment?
- A) "attentional blink" takes about ten seconds
 - B) lag occurs if we concentrate on one object while second one appears
 - C) we always have trouble in reacting to the second one
 - D) first limitation can be avoided by certain measures
- 35 Which one is NOT correct about Meyer's experiments and statements?
- A) just after failure in several attempts can people execute dual-task
 - B) Practice can overcome dual-task interference
 - C) Meyer holds a different opinion on Marois's theory
 - D) an existing processor decides whether delay another task or not

Questions 36-40

Do the following statements agree with the Information given In Reading Passage 3? In boxes 36-40 on your answer sheet, write

- | | |
|------------------|---|
| YES | <i>If the statement is true</i> |
| NO | <i>if the statement is false</i> |
| NOT GIVEN | <i>if the information is not given in the passage</i> |

36. Longer gap between two presenting tasks means shorter delay toward the second one.
37. Incapable human memory cause people sometimes miss the differences when presented two similar images.
38. Marois has different opinion on the claim that training removes bottleneck effect.
39. Art Kramer proved there is a correlation between multitasking performance and genders
40. The author doesn't believe that effect of practice could bring any variation.

Reading 28

PASSAGE 1

THE ADDICTION TO TV

A The amount of time people spend watching television is astonishing. On average, individuals in the industrialized world devote three hours a day to the pursuit —fully half of their leisure time, and more than on any single activity save work and sleep. At this rate, someone who lives to 75 would spend nine years in front of the tube. To some commentators, this devotion means simply that people enjoy TV and make a conscious decision to watch it. But if that is the whole story, why do so many people experience misgivings about how much they view? In Gallup polls in 1992 and 1999, two out of five adult respondents and seven out of 10 teenagers said they spent too much time watching TV. Other surveys have consistently shown that roughly 10 percent of adults call themselves TV addicts.

B To study people's reactions to TV, researchers have experiments in which they have monitored the brain waves (using an electroencephalograph, or EEG) to track behavior and emotion in the normal course of life, as opposed to the artificial conditions of the lab. Participants carried a beeper, and we signaled them six to eight times a day, at random, over the period of a week; whenever they heard the beep, they wrote down what they were doing and how they were feeling using a standardized scorecard.

C As one might expect, people who were watching TV when we beeped them reported feeling relaxed and passive. The EEG studies similarly show less mental stimulation, as measured by alpha brain-wave production, during viewing than during reading. What is more surprising is that the sense of relaxation ends when the set is turned off, but the feelings of passivity and lowered alertness continue. Survey participants say they have more difficulty concentrating after viewing than before. In contrast, they rarely indicate such difficulty after reading. After playing sports or engaging in hobbies, people report improvements in mood. After watching TV, people's moods are about the same or worse than before. That may be because viewers' vague learned sense that they will feel less relaxed if they stop viewing. So they tend not to turn the set off. Viewing begets more viewing which is the same as the experience of habit-forming drugs. Thus, the irony of TV: people watch a great deal longer than they plan to, even though prolonged viewing is less rewarding. In our ESM studies the longer people sat in front of the set, the less satisfaction they said they derived from it. For some, a twinge of unease or guilt that they aren't doing something more productive may also accompany and depreciate the enjoyment of prolonged viewing. Researchers in Japan, the U.K. and the U.S. have found that this guilt occurs much more among middle-class viewers than among less affluent ones.

D What is it about TV that has such a hold on us? In part, the attraction seems to spring from our biological 'orienting response.' First described by Ivan Pavlov in 1927, the orienting response is our instinctive visual or auditory reaction to any sudden or novel stimulus. It is part of our evolutionary heritage, a built-in sensitivity to movement and potential predatory threats. In 1986 Byron Reeves of Stanford University, Esther Thorson of the University of Missouri and their colleagues began to study whether the simple formal features of television—cuts, edits, zooms, pans, sudden noises — activate the orienting response, thereby keeping attention on the screen. By watching how brain waves were affected by formal features, the researchers concluded that

these stylistic tricks can indeed trigger involuntary responses and 'derive their attentional value through the evolutionary significance of detecting movement.... It is the form, not the content, of television that is unique.

E The natural attraction to television's sound and light starts very early in life. Dafna Lemish of Tel Aviv University has described babies at six to eight weeks attending to television. We have observed slightly older infants who, when lying on their backs on the floor, crane their necks around 180 degrees to catch what light through yonder window breaks. This inclination suggests how deeply rooted the orienting response is.

F The Experience Sampling Method permitted us to look closely at most every domain of everyday life: working, eating, reading, talking to friends, playing a sport, and so on. We found that heavy viewers report feeling significantly more anxious and less happy than light viewers do in unstructured situations, such as doing nothing, daydreaming or waiting in line. The difference widens when the viewer is alone. Subsequently, Robert D. McIlwraith of the University of Manitoba extensively studied those who called themselves TV addicts on surveys. On a measure called the Short Imaginal Processes Inventory (SIPI), he found that the self-described addicts are more easily bored and distracted and have poorer attentional control than the non-addicts. The addicts said they used TV to distract themselves from unpleasant thoughts and to fill time. Other studies over the years have shown that heavy viewers are less likely to participate in community activities and sports and are more likely to be obese than moderate viewers or non-viewers.

G More than 25 years ago psychologist Tannis M. MacBeth Williams of the University of British Columbia studied a mountain community that had no television until cable finally arrived. Over time, both adults and children in the town became less creative in problem solving, less able to persevere at tasks, and less tolerant of unstructured time.

H Nearly 40 years ago Gary A. Steiner of the University of Chicago collected fascinating individual accounts of families whose set had broken. In experiments, families have volunteered or been paid to stop viewing, typically for a week or a month. Some fought, verbally and physically. In a review of these cold-turkey studies, Charles Winick of the City University of New York concluded: The first three or four days for most persons were the worst, even in many homes where viewing was minimal and where there were other ongoing activities. In over half of all the households, during these first few days of loss, the regular routines were disrupted, family members had difficulties in dealing with the newly available time, anxiety and aggressions were expressed. By the second week, a move toward adaptation to the situation was common.' Unfortunately, researchers have yet to flesh out these anecdotes; no one has systematically gathered statistics on the prevalence of these withdrawal symptoms.

I Even though TV does seem to meet the criteria for substance dependence, not all researchers would go so far as to call TV addictive. McIlwraith said in 1998 that 'displacement of other activities by television may be socially significant but still fall short of the clinical requirement of significant impairment.' He argued that a new category of 'TV addiction' may not be necessary if heavy viewing stems from conditions such as depression and social phobia. Nevertheless, whether or not we formally diagnose someone as TV-dependent, millions of people sense that they cannot readily control the amount of television they watch.

Questions 1-5

Do the following statements agree with the claims of the writer in Reading Passage?

TRUE *If the statement is true*

FALSE *If the statement is false*

NOT GIVEN *if the information is not given in the passage*

1. Study shows that males are more likely to be addicted to TV than females.
2. Greater improvements in mood are experienced after watching TV than playing sports.
3. TV addiction works in similar ways as drugs.
4. It is reported that people's satisfaction is in proportion to the time they spend watching TV.
5. Middle-class viewers are more likely to feel guilty about watching TV than the poor.

Questions 6-10

Look at the following researchers (Questions 6-10) and the list of statements. Match each researcher with the correct statements. Write the correct letter **A-H** in boxes 6-10 on your answer sheets.

6. Byron Reeves and Esther Thorson
7. Dafna Lemish
8. Robert D. McIlwraith
9. Tannis M. MacBeth Williams
10. Charles Winick

List of Statements

- A. Audiences would get hypnotized from viewing too much television.
- B. People have been sensitive to the TV signals since a younger age.
- C. People are less likely to accomplish their work with television.
- D. A handful of studies have attempted to study other types of media addiction.
- E. The addictive power of television could probably minimize the problems.
- F. Various media formal characters stimulate people's reaction on the screen.
- G. People who believe themselves to be TV addicts are less likely to join in the group activities.
- H. It is hard for people to accept the life without TV at the beginning.

Questions 11-13

Choose the correct letter, **A, B, C** or **D**. Write the correct letter in boxes 11-13 on your answer sheet.

11 People in the industrialized world

- A) devote ten hours watching TV on average.
- B) spend more time on TV than other entertainment.
- C) call themselves TV addicts.
- D) working best.

12 When compared with light viewers, heavy viewers

- A) like playing sport more than reading.
- B) feel relaxed after watching TV.
- C) spend more time in daydreaming.
- D) are more easily bored while waiting in line.

13 Which of the following statements is true about the family experiment?

- A) Not all the subjects participate in the experiment for free.
- B) There has been a complete gathered data.
- C) People are prevented from other activities during the experiment.
- D) People cannot adapt to the situation until the end

PASSAGE 2

THE ENDANGERED BAMBOO PLANT

The wonder plant with an uncertain future: more than a billion people rely on bamboo for either their shelter or income, while many endangered species depend on it for their survival. Despite its apparent abundance, a new report says that species of bamboo may be under serious threat.

Section A

Every year, during the rainy season, the mountain gorillas of Central Africa migrates to the foothills and lower slopes of the Virunga Mountains to graze on bamboo. For the 650 or so that remain in the wild, it's a vital food source. Although they eat almost 150 types of plant, as well as various insects and other invertebrates, at this time of year bamboo accounts for up to 90 per cent of their diet. Without it, says Ian Redmond, chairman of the Ape Alliance, their chances of survival would be reduced significantly. Gorillas aren't the only locals keen on bamboo. For the people who live close to the Virungas, it's a valuable and versatile raw material used for building houses and making household items such as mats and baskets. But in the past 100 years or so, resources have come under increasing pressure as populations have exploded and large areas of bamboo forest have been cleared to make way for farms and commercial plantations.

Section B

Sadly, this isn't an isolated story. All over the world, the ranges of many bamboo species appear to be shrinking, endangering the people and animals that depend upon them. But despite bamboo's importance, we know surprisingly little about it. A recent report published by the UN Environment Programme (UNEP) and the International Network for Bamboo and Rattan (INBAR) has revealed just how profound is our ignorance of global bamboo resources, particularly in relation to conservation. There are almost 1,600 recognised species of bamboo, but the report concentrated on the 1,200 or so woody varieties distinguished by the strong stems, or culms, that most people associate with this versatile plant. Of these, only 38 'priority species' identified for their commercial value have been the subject of any real scientific research, and this has focused mostly on matters relating to their viability as a commodity. This problem isn't confined to bamboo. Compared to the work carried out on animals, the science of assessing the conservation status of plants is still in its infancy. "People have only started looking hard at this during the past 10-15 years, and only now are they getting a handle on how to go about it systematically," says Dr. Valerie Kapos, one of the report's authors and a senior adviser in forest ecology and conservation to the UNEP.

Section C

Bamboo is a type of grass. It comes in a wide variety of forms, ranging in height from 30 centimetres to more than 40 metres. It is also the world's fastest-growing woody plant; some species can grow more than a metre in a day. Bamboo's ecological role extends beyond providing food and habitat for animals. Bamboo tends to grow in stands made up of groups of individual plants that grow from root systems known as rhizomes. Its extensive rhizome systems, which tie in predicting the top layers of the soil, are crucial in preventing soil erosion. And there is growing evidence that bamboo plays an important part in determining forest structure and dynamics. "Bamboo's pattern of mass flowering and mass death leaves behind large areas of dry biomass that attract wildfire," says Kapos. "When these burn, they create patches of open ground within the forest far bigger than would be left by a fallen tree." Patchiness helps to preserve diversity because certain plant species do better during the early stages of regeneration when there are gaps in the canopy.

Section D

However, bamboo's most immediate significance lies in its economic value. Modern processing techniques mean that it can be used in a variety of ways, for example, as flooring and laminates. One of the fastest growing bamboo products is paper - 25 per cent of paper produced in India is made from bamboo fiber and in Brazil, 100,000 hectares of bamboo are grown for its production. Of course, bamboo's main function has always been in domestic applications, and as a locally traded commodity it's worth about US\$4.5 billion annually. Because of its versatility, flexibility and strength (its tensile strength compares to that of some steel), it has traditionally been used in construction. Today, more than one billion people worldwide live in bamboo houses. Bamboo is often the only readily available raw material for people in many developing countries, says Chris Stapleton, a research associate at the Royal Botanic Gardens. "Bamboo can be harvested from forest areas or grown quickly elsewhere, and then converted simply without expensive machinery or facilities," he says. "In this way, it contributes substantially to poverty alleviation and wealth creation."

Section E

Given bamboo's value in economic and ecological terms, the picture painted by the UNEP report is all the more worrying. But keen horticulturists will spot an apparent contradiction here. Those who've followed the recent vogue for cultivating exotic species in their gardens will point out that if it isn't kept in check, bamboo can cause real problems. "In a lot of places, the people who live with bamboo don't perceive it as being endangered in any way," says Kapos. "In fact, a lot of bamboo species are actually very invasive if they've been introduced." So why are so many species endangered? There are two separate issues here, says Ray Townsend, vice president of the British Bamboo Society and arboretum manager at the Royal Botanic Gardens. "Some plants are threatened because they can't survive in the habitat - they aren't strong enough or there aren't enough of them, perhaps. But bamboo can take care of itself - it is strong enough to survive if left alone. What is under threat is its habitat." It is the physical disturbance that is the threat to bamboo, says Kapos. "When forest goes, it is converted into something else: there isn't any-where for forest plants such as bamboo to grow if you create a cattle pasture."

Section F

Around the world, bamboo species are routinely protected as part of forest eco systems in national parks and reserves, but there is next to nothing that protects bamboo in the wild for its own sake. However, some small steps are being taken to address this situation. The UNEP-INBAR report will help conservationists to establish effective measures aimed at protecting valuable wild bamboo species. Towns end, too, sees the UNEP report as an important step forward in promoting the cause of bamboo conservation. "Until now, bamboo has been perceived as a second-class plant. When you talk about places such as the Amazon, everyone always thinks about the hardwoods. Of course these are significant, but there is a tendency to overlook the plants they are associated with, which are often bamboo species. In many ways, it is the most important plant known to man. I can't think of another plant that is used so much and is so commercially important in so many countries." He believes that the most important first step is to get scientists into the field. "We need to go out there, look at these plants and see how they survive and then use that information to conserve them for the future."

Questions 14 -20

Reading Passage 1 has six sections A -F. Which section contains the following information? Write the correct letter A-F in boxes 14-20 on your answer sheet. NB You may use any letter more than once

14. Limited extent of existing research
15. Comparison of bamboo with other plant species
16. Commercial application of bamboo
17. Example of an animal which rely on bamboos for survival
18. Human activity that damaged large areas of bamboo
19. The approaches used to study bamboo
20. Bamboo helps the survival of a range of plants

Questions 21-24

Use the information in the passage to match the people (listed A-D) with opinions or deeds below. Write the appropriate letters A-d in boxes 21-24 on your answer sheet.

NB you may use any letter more than once

- A Ian Redmond
- B Valerie Kapos
- C Ray Townsend
- D Chris Stapleton

21. Destroying bamboo jeopardizes to wildlife.
22. People have very confined knowledge of bamboo.
23. Some people do not think that bamboo is endangered.
24. Bamboo has loads of commercial potentials.

Questions 25-26

Answer the questions below using **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 12-13 on your answer sheet

25. What problem does the bamboo's root system prevent?
26. Which bamboo product is experiencing market expansion

PASSAGE 3

BIODIVERSITY – WHAT IS IT EXACTLY?

- A. It seems biodiversity has become a buzzword beloved of politicians, conservationists, protesters and scientists alike. But what exactly is it? The Convention on Biological Diversity, an international agreement to conserve and share the planet's biological riches, provides a good working definition: biodiversity comprises every form of life, from the smallest microbe to the largest animal or plant, the genes that give them their specific characteristics and the ecosystems of which they are a part.
- B. In October, the World Conservation Union (also known as the IUCN) published its updated Red List of Threatened Species, a roll call of 11,167 creatures facing extinction -121 more than when the list was last published in 2000. But the new figures almost certainly underestimate the crisis. Some 1.2 million species of animal and 270,000 species of plant have been classified, but the well-being of only a fraction has been assessed. The resources are simply not available. The IUCN reports that 5714 plants are threatened, for example, but admits that only 4 per cent of known plants have been assessed. And, of course, there are thousands of species that we have yet to discover. Many of these could also be facing extinction.
- C. It is important to develop a picture of the diversity of life on Earth now, so that comparisons can be made in the future and trends identified. But it isn't necessary to observe every single type of organism in an area to get a snapshot of the health of the ecosystem. In many habitats there are species that are particularly susceptible to shifting conditions, and these can be used as indicator species.

- D. In the media, it is usually large, charismatic animals such as pandas, elephants, tigers and whales that get all the attention when loss of biodiversity is discussed. However, animals or plants far lower down the food chain are often the ones vital for preserving habitats - in the process saving the skins of those more glamorous species. These are known as keystone species.
- E. By studying the complex feeding relationships within habitats, species can be identified that have a particularly important impact on the environment. For example, the members of the fig family are the staple food for hundreds of different species in many different countries, so important that scientists sometimes call figs "jungle burgers". A whole range of animals, from tiny insects to birds and large mammals, feed on everything from the tree's bark and leaves to its flowers and fruits. Many fig species have very specific pollinators. There are several dozen species of fig tree in Costa Rica, and a different type of wasp has evolved to pollinate each one. Chris Lyle of the Natural History Museum in London - who is also involved in the Global Taxonomy Initiative of the Convention on Biological Diversity - points out that if fig trees are affected by global warming, pollution, disease or any other catastrophe, the loss of biodiversity will be enormous.
- F. Similarly, sea otters play a major role in the survival of giant kelp forests along the coasts of California and Alaska. These "marine rainforests" provide a home for a wide range of other species. The kelp itself is the main food of purple and red sea urchins and in turn the urchins are eaten by predators, particularly sea otters. They detach an urchin from the seabed then float to the surface and lie on their backs with the urchin shell on their tummy, smashing it open with a stone before eating the contents. Urchins that are not eaten tend to spend their time in rock crevices to avoid the predators. This allows the kelp to grow - and it can grow many centimetres in a day. As the forests form, bits of kelp break off and fall to the bottom to provide food for the urchins in their crevices. The sea otters thrive hunting for sea urchins in the kelp, and many other fish and invertebrates live among the fronds. The problems start when the sea otter population declines. As large predators they are vulnerable - their numbers are relatively small so disease or human hunters can wipe them out. The result is that the sea urchin population grows unchecked and they roam the sea floor eating young kelp fronds. This tends to keep the kelp very short and stops forests developing, which has a huge impact on biodiversity.
- G. Conversely, keystone species can also make dangerous alien species: they can wreak havoc if they end up in the wrong ecosystem. The cactus moth, whose caterpillar is a voracious eater of prickly pear was introduced to Australia to control the rampant cacti. It was so successful that someone thought it would be a good idea to introduce it to Caribbean islands that had the same problem. It solved the cactus menace, but unfortunately some of the moths have now reached the US mainland - borne on winds and in tourists' luggage - where they are devastating the native cactus populations of Florida.
- H. Organisations like the Convention on Biological Diversity work with groups such as the UN and with governments and scientists to raise awareness and fund research. A number of major international meetings - including the World Summit on Sustainable Development in Johannesburg this year - have set targets for governments around the world to slow the loss

of biodiversity. And the CITES meeting in Santiago last month added several more names to its list of endangered species for which trade is controlled. Of course, these agreements will prove of limited value if some countries refuse to implement them.

- I. There is cause for optimism, however. There seems to be a growing understanding of the need for sustainable agriculture and sustainable tourism to conserve biodiversity. Problems such as illegal logging are being tackled through sustainable forestry programmes, with the emphasis on minimising the use of rainforest hardwoods in the developed world and on rigorous replanting of whatever trees are harvested. CITES is playing its part by controlling trade in wood from endangered tree species. In the same way, sustainable farming techniques that minimise environmental damage and avoid monoculture.
- J. Action at a national level often means investing in public education and awareness. Getting people like you and me involved can be very effective. Australia and many European countries are becoming increasingly efficient at recycling much of their domestic waste, for example, preserving natural resources and reducing the use of fossil fuels. This in turn has a direct effect on biodiversity by minimising pollution, and an indirect effect by reducing the amount of greenhouse gases emitted from incinerators and landfill sites. Preserving ecosystems intact for future generations to enjoy is obviously important, but biodiversity is not some kind of optional extra. Variety may be "the spice of life", but biological variety is also our life-support system.

Questions 27-33

*Do the following statements agree with the Information given in Reading Passage 2
In boxes 27-33 on your answer sheet, write*

- | | |
|------------------|---|
| TRUE | <i>If the statement is true</i> |
| FALSE | <i>If the statement is false</i> |
| NOT GIVEN | <i>If the Information is not given in the passage</i> |

27. The term "biodiversity" consists of living creatures and environment that they live in.
28. There are species that have not been researched because it's unnecessary to study all creatures.
29. It is not necessary to investigate all creatures in a certain place.
30. The press more often than not focuses on animals well-known.
31. There is a successful case that cactus moth plays a positive role in the US.
32. Usage of hardwoods is forbidden in some European countries.
33. Agriculture experts advise farmers to plant single crops in the field in terms of sustainable farming.

Questions 34-39

Summary

Complete the following summary of the paragraphs of Reading Passage, using **NO MORE THAN TWO WORDS** from the Reading Passage for each answer.

Write your answers in boxes 34-39 on your answer sheet.

Because of the ignorance brought by media, people tend to neglect significant creatures called **34** _____. Every creature has diet connections with others, such as **35** _____ which provide a majority of foods for other species. In some states of America, decline in number of sea otters leads to the boom of **36** _____. An impressive case is that imported **37** _____ successfully tackles the plant cacti in **38** _____. However, the operation is needed for the government to increase their financial support in **39** _____.

Reading 29

PASSAGE 1

CHEMICAL FERTILISERS OR THE NATURAL APPROACH

- A. The world's population continues to climb. And despite the rise of high-tech agriculture, 800 million people don't get enough to eat. Clearly it's time to rethink the food we eat and where it comes from. Feeding 9 billion people will take more than the same old farming practices, especially if we want to do it without felling rainforests and planting every last scrap of prairie. Finding food for all those people will tax predicting farmers'— and researchers'—ingenuity to the limit. Yet already, precious aquifers that provide irrigation water for some of the world's most productive farmlands are drying up or filling with seawater, and arable land in China is eroding to create vast dust storms that redden sunsets as far away as North America. "Agriculture must become the solution to environmental problems in 50 years. If we don't have systems that make the environment better-not just hold the fort-then we're in trouble," says Kenneth Cassman, an agronomist at the University of Nebraska at Lincoln. That view was echoed in January by the Curry report, a government panel that surveyed the future of farming and food in Britain.
- B. It's easy to say agriculture has to do better, but what should this friendly farming of the future look like? Concerned consumers come up short at this point, facing what appears to be an ever-widening ideological divide. In one corner are the techno-optimists who put their faith in genetically modified crops, improved agrochemicals and computer-enhanced machinery; in the other are advocates of organic farming, who reject artificial chemicals and embrace back-to-nature techniques such as composting. Both sides cite plausible science to back their claims to the moral high ground, and both bring enough passion to the debate for many people to come away thinking we're faced with a stark choice between two mutually incompatible options.
- C. Not so. If you take off the ideological blinkers and simply ask how the world can produce the food it needs with the least environmental cost, a new middle way opens. The key is sustainability: whatever we do must not destroy the capital of soil and water we need to keep on producing. Like today's organic farming, the intelligent farming of the future should pay much more attention to the health of its soil and the ecosystem it's part of. But intelligent farming should also make shrewd and locally appropriate use of chemical fertilisers and pesticides. The most crucial ingredient in this new style of agriculture is not chemicals but information about what's happening in each field and how to respond. Yet ironically, this key element may be the most neglected today.
- D. Clearly, organic farming has all the warm, fuzzy sentiment on its side. An approach that eschews synthetic chemicals surely runs no risk of poisoning land and water. And its emphasis on building up natural ecosystems seems to be good for everyone. Perhaps these easy assumptions explain why sales of organic food across Europe are increasing by at least 50 per cent per year.
- E. Going organic sounds idyllic-but it's naive, too. Organic agriculture has its own suite of environmental costs, which can be worse than those of conventional farming, especially if it were to become the world norm. But more fundamentally, the organic versus-chemical debate focuses on the wrong question. The issue isn't what you put into a farm, but what you get out of it, both in terms of crop yields and pollutants, and what condition the farm is in when you're done.

- F. Take chemical fertilisers, which deliver nitrogen, an essential plant nutrient, to crops along with some phosphorus and potassium. It is a mantra of organic farming that these fertilisers are unwholesome, and plant nutrients must come from natural sources. But in fact the main environmental damage done by chemical fertilisers as opposed to any other kind is through greenhouse gases-carbon dioxide from the fossil fuels used in their synthesis and nitrogen oxides released by their degradation. Excess nitrogen from chemical fertilisers can pollute groundwater, but so can excess nitrogen from organic manures.
- G. On the other hand, relying solely on chemical fertilisers to provide soil nutrients without doing other things to build healthy soil is damaging. Organic farmers don't use chemical fertilisers, so they are very good at building soil fertility by working crop residues and manure into the soil, rotating with legumes that fix atmospheric nitrogen, and other techniques.
- H. This generates vital soil nutrients and also creates a soil that is richer in organic matter, so it retains nutrients better and is hospitable to the crop's roots and creatures such as earthworms that help maintain soil fertility. Such soil also holds water better and therefore makes more efficient use of both rainfall and irrigation water. And organic matter ties up CO₂ in the soil, helping to offset emissions from burning fossil fuels and reduce global warming.
- I. Advocates of organic farming like to point out that fields managed in this way can produce yields just as high as fields juiced up with synthetic fertilisers. For example, Bill Liebhardt, research manager at the Rodale Institute in Kutztown, Pennsylvania recently compiled the results of such comparisons for corn, wheat, soybeans and tomatoes in the US and found that the organic fields averaged between 94 and 100 per cent of the yields of nearby conventional crops.
- J. But this optimistic picture tells only half the story. Farmers can't grow such crops every year if they want to maintain or build soil nutrients without synthetic fertilisers. They need to alternate with soil-building crops such as pasture grasses and legumes such as alfalfa. So in the long term, the yield of staple grains such as wheat, rice and corn must go down. This is the biggest cost of organic farming. Vaclav Smil of the University of Manitoba in Winnipeg, Canada, estimates that if farmers worldwide gave up the 80 million tonnes of synthetic fertiliser they now use each year, total grain production would fall by at least half. Either farmers would have to double the amount of land they cultivate- at catastrophic cost to natural habitat -or billions of people would starve.
- K. That doesn't mean farmers couldn't get by with less fertilizer. Technologically advanced farmers in wealthy countries, for instance, can now monitor their yields hectare by hectare, or even more finely, throughout a huge field. They can then target their fertiliser to the parts of the field where it will do the most good, instead of responding to average conditions. This increases yield and decreases fertiliser use. Eventually, farmers may incorporate long-term weather forecasts into their planning as well, so that they can cut back on fertiliser use when the weather is likely to make harvests poor anyway, says Ron Olson, an agronomist with Cargill Fertilizer in Tampa, Florida.
- L. Organic techniques certainly have their benefits, especially for poor farmers. But strict "organic agriculture", which prohibits certain technologies and allows others, isn't always better for the

environment. Take herbicides, for example. These can leach into waterways and poison both wildlife and people. Just last month, researchers led by Tyrone Hayes at the University of California at Berkeley found that even low concentrations of atrazine, the most commonly used weedkiller in the US, can prevent frog tadpoles from developing properly.

Questions 1-4

Use the information in the passage to match the people (listed A-D) with opinions or deeds below. Write the appropriate letters **A-D** in boxes 1-4 on your answer sheet

- A Vaclav Smil
- B Bill Liebhardt
- C Kenneth Cassman
- D Ron Olson

1. Use of chemical fertilizer can be optimised by combining weather information.
2. Organic farming yield is nearly equal to traditional ones.
3. Better agricultural setting is a significant key to solve environmental tough nut.
4. Substantial production loss would happen in case all farmers shifted from using synthetic fertiliser.

Questions 5-9

Do the following statements agree with the information given in Reading Passage 1. Write

- | | |
|------------------|--|
| YES | if the statement agrees with the information |
| NO | if the statement contradicts the information |
| NOT GIVEN | if there is no information on this |

5. Increasing population, draining irrigation, eroding farmland push agricultural industry to extremity.
6. There are only two options for farmers; they use chemical fertiliser or natural approach.
7. Chemical fertilizers currently are more expensive than the natural fertilisers.
8. In order to keep nutrient in the soil, organic farmers need to rotate planting method.
9. Organic agriculture" is the way that environment-damaging technologies are all strictly forbidden.

Questions 10-13

Complete the following summary of the paragraphs of Reading Passage, using **NO MORE THAN TWO WORDS** from the Reading Passage for each answer. Write your answers in boxes 10-13 on your answer sheet

Several 10..... approaches need to be applied in order that global population wouldn't go starved. A team called 11..... repeated the viewpoint of a scholar by a survey in British farming. More and more European farmers believe in 12 farming these years. The argument of organic against 13 in inaccurate direction. seems in an

PASSAGE 2

THE TYPES OF PEARLS

- A. Throughout history, pearls have held a unique presence within the wealthy and powerful. For instance, the pearl was the favored gem of the wealthy during the Roman Empire. This gift from the sea had been brought back from the orient by the Roman conquests. Roman women wore pearls to bed so they could be reminded of their wealth immediately upon waking up. Before jewelers learned to cut gems, the pearl was of greater value than the diamond. In the Orient and Persia Empire, pearls were ground into powders to cure anything from heart disease to epilepsy, with possible aphrodisiac uses as well. Pearls were once considered an exclusive privilege for royalty. A law in 1612 drawn up by the Duke of Saxony prohibited the wearing of pearls by nobility, professors, doctors or their wives in an effort to further distinguish royal appearance. American Indians also used freshwater pearls from the Mississippi River as decorations and jewelry.
- B. There are essentially three types of pearls: natural, cultured and imitation. A natural pearl (often called an Oriental pearl) forms when an irritant, such as a piece of sand, works its way into a particular species of oyster, mussel, or clam. As a defense mechanism, the mollusk secretes a fluid to coat the irritant. Layer upon layer of this coating is deposited on the irritant until a lustrous pearl is formed.
- C. The only difference natural pearls and cultured pearls is that the irritant is a surgically implanted bead or piece of shell called Mother of Pearl. Often, these shells are ground oyster shells that are worth significant amounts of money in their own right as irritant-catalysts for quality pearls. The resulting core is, therefore, much larger than in a natural pearl. Yet, as long as there are enough layers of nacre (the secreted fluid covering the irritant) to result in a beautiful, gem-quality pearl, the size of the nucleus is of no consequence to beauty or durability.
- D. Pearls can come from either salt or freshwater sources. Typically, saltwater pearls tend to be higher quality, although there are several types of freshwater pearls that are considered high in quality as well. Freshwater pearls tend to be very irregular in shape, with a puffed rice appearance the most prevalent. Nevertheless, it is each individual pearls merits that determines value more than the source of the pearl. Saltwater pearl oysters are usually cultivated in protected lagoons or volcanic atolls. However, most freshwater cultured pearls sold today come from China. Cultured pearls are the response of the shell to a tissue implant. A tiny piece of mantle tissue from a donor shell is transplanted into a recipient shell. This graft will form a pearl sac and the tissue will precipitate calcium carbonate into this pocket. There are a number of options for producing cultured pearls: use freshwater or seawater shells, transplant the graft into the mantle or into the gonad, add a spherical bead or do it non-beaded. The majority of saltwater cultured pearls are grown with beads.
- E. Regardless of the method used to acquire a pearl, the process usually takes several years. Mussels must reach a mature age, which can take up to 3 years, and then be implanted or naturally receive an irritant. Once the irritant is in place, it can take up to another 3 years for the pearl to reach its full size. Often, the irritant may be rejected, the pearl will be terrifically misshapen, or the oyster may simply die from disease or countless other complications. By the end of a 5 to 10 year cycle, only 50% of the oysters will have survived. And of the pearls produced, only approximately 5%

are of substantial quality for top jewelry makers. From the outset, a pearl farmer can figure on spending over \$100 for every oyster that is farmed, of which many will produce nothing or die.

- F. Imitation pearls are a different story altogether. In most cases, a glass bead is dipped into a solution made from fish scales. This coating is thin and may eventually wear off. One can usually tell an imitation by biting on it. Fake pearls glide across your teeth, while the layers of nacre on real pearls feel gritty. The Island of Mallorca (in Spain) is known for its imitation pearl industry. Quality natural pearls are very rare jewels. The actual value of a natural pearl is determined in the same way as it would be for other "precious" gems. The valuation factors include size, shape, and color, quality of surface, orient and luster. In general, cultured pearls are less valuable than natural pearls, whereas imitation pearls almost have no value. One way that jewelers can determine whether a pearl is cultured or natural is to have a gem lab perform an x-ray of the pearl. If the x-ray reveals a nucleus, the pearl is likely a bead-nucleated saltwater pearl. If no nucleus is present, but irregular and small dark inner spots indicating a cavity are visible, combined with concentric rings of organic substance, the pearl is likely a cultured freshwater. Cultured freshwater pearls can often be confused for natural pearls which present as homogeneous pictures which continuously darken toward the surface of the pearl. Natural pearls will often show larger cavities where organic matter has dried out and decomposed. Although imitation pearls look the part, they do not have the same weight or smoothness as real pearls, and their luster will also dim greatly. Among cultured pearls, Akoya pearls from Japan are some of the most lustrous. A good quality necklace of 40 Akoya pearls measuring 7mm in diameter sells for about \$1,500, while a super-high quality strand sells for about \$4,500. Size on the other hand, has to do with the age of the oyster that created the pearl (the more mature oysters produce larger pearls) and the location in which the pearl was cultured. The South Sea waters of Australia tend to produce the larger pearls; probably because the water along the coast line is supplied with rich nutrients from the ocean floor. Also, the type of mussel common to the area seems to possess a predilection for producing comparatively large pearls.
- G. Historically, the world's best pearls came from the Persian Gulf, especially around what is now Bahrain. The pearls of the Persian Gulf were natural created and collected by breath-hold divers. The secret to the special luster of Gulf pearls probably derived from the unique mixture of sweet and salt water around the island. Unfortunately, the natural pearl industry of the Persian Gulf ended abruptly in the early 1930's with the discovery of large deposits of oil. Those who once dove for pearls sought prosperity in the economic boom ushered in by the oil industry. The water pollution resulting from spilled oil and indiscriminate over-fishing of oysters essentially ruined the once pristine pearl producing waters of the Gulf. Today, pearl diving is practiced only as a hobby. Still, Bahrain remains one of the foremost trading centers for high quality pearls. In fact, cultured pearls are banned from the Bahrain pearl market, in an effort to preserve the location's heritage. Nowadays, the largest stock of natural pearls probably resides in India. Ironically, much of India's stock of natural pearls came originally from Bahrain. Unlike Bahrain, which has essentially lost its pearl resource, traditional pearl fishing is still practiced on a small scale in India.

Questions 14-17

Reading Passage 2 has seven paragraphs, A-G. Which paragraph contains the following information?

Write the correct letter A-G in boxes 14-17 on your answer sheet.

14. Ancient stories around the pearl and customers
15. Difficulties in cultivating process.
16. Factors can decide the value of natural pearls.
17. Different growth mechanisms that distinguish the cultured pearls from natural ones.

Questions 18-23

Complete the summary below. Choose letter from A-K for each answer. Write them in boxes 18-23 on your answer sheet

In ancient history, pearls have great importance within the rich and rulers, which was treated as gem for women in 18 And pearls were even used as medicine and sex drug for people in 19 There are essentially three types of pearls: natural, cultured and imitation. Most freshwater cultured pearls sold today come from China while the 20 is famous for its imitation pearl industry. The country 21 usually manufactures some of the glitteriest cultured ones while the nation such as 22 produces the larger sized pearl due to the favorable environment along the coast line. In the past, one country of 23 in Gulf produced the world's best pearls. Nowadays, the major remaining suppliers of the natural pearls belongs to India

Questions 24 - 27

Do the following statements agree with the information given in the Reading Passage 1? In boxes 11-14 on your answer sheet, write

TRUE If the statement is true

FALSE If the statement is false

NOT GIVEN If the information is not given in the passage

24. Often cultured pearl's centre is significantly larger than in a natural pearl.
25. Cultivated cultured pearls are generally valued the same much as natural ones.
26. The size of pearls produced in Japan is usually of smaller size than those came from Australia.
27. Akoya pearls from Japan Glows more deeply than the South Sea pearls of Australia.

PASSAGE 3

MIMIC YOUR NEIGHBOR

- A. There's no animal that symbolises rainforest diversity quite as spectacularly as the tropical butterfly. Anyone lucky enough to see these creatures flitting between patches of sunlight cannot fail to be impressed by the variety of their patterns. But why do they display such colourful exuberance? Until recently, this was almost as pertinent a question as it had been when the 19th-century naturalists, armed only with butterfly nets and insatiable curiosity, battled through the rainforests. These early explorers soon realised that although some of the butterflies' bright colours are there to attract a mate, others are warning signals. They send out a message to any predators: "Keep off, we're predicting poisonous." And because wearing certain patterns affords protection, other species copy them. Biologists use the term mimicry rings for these clusters of impostors and their evolutionary idol.
- B. But here's the conundrum. "Classical mimicry theory says that only a single ring should be found in any one area," explains George Beccaloni of the Natural History Museum, London. The idea is that in each locality there should be just the one pattern that best protects its wearers. Predators would quickly learn to avoid it and eventually all mimetic species in a region should converge upon it. "The fact that this is patently not the case has been one of the major problems in mimicry research," says Beccaloni. In pursuit of a solution to the mystery of mimetic exuberance, Beccaloni set off for one of the megacentres for butterfly diversity, the point where the western edge of the Amazon basin meets the foothills of the Andes in Ecuador. "It's exceptionally rich, but comparatively well collected, so I pretty much knew what was there", says Beccaloni. "The trick was to work out how all the butterflies were organised and how this related to mimicry."
- C. Working at the Jatun Sacha Biological Research Station on the banks of the Rio Napo, Beccaloni focused his attention on a group of butterflies called ithomiines. These distant relatives of Britain's Camberwell Beauty are abundant throughout Central and South America and the Caribbean. They are famous for their bright colours, toxic bodies and complex mimetic relationships. "They can comprise up to 85 per cent of the individuals in a mimicry ring and their patterns are mimicked not just by butterflies, but by other insects as diverse as damselflies and true bugs," says Philip DeVries of the Milwaukee Public Museum's Center for Biodiversity Studies.
- D. Even though all ithomiines are poisonous, it is in their interests to evolve to look like one another because predators that learn to avoid one species will also avoid others that resemble it. This is known as Mullerian mimicry. Mimicry rings may also contain insects that are not toxic, but gain protection by looking like a model species that is: an adaptation called Batesian mimicry. So strong is an experienced predator's avoidance response that even quite inept resemblance gives some protection. "Often there will be a whole series of species that mimic, with varying degrees of verisimilitude, a focal or model species," says John Turner from the University of Leeds. "The results of these deceptions are some of the most exquisite examples of evolution known to science." In addition to colour, many mimics copy behaviours and even the flight pattern of their model species.
- E. But why are there so many different mimicry rings? One idea is that species flying at the same height in the forest canopy evolve to look like one another. "It had been suggested since the 1970s

that mimicry complexes were stratified by flight height," says DeVries. The idea is that wing colour patterns are camouflaged against the different patterns of light and shadow at each level in the canopy, providing a first line of defence, against predators." But the light patterns and wing patterns don't match very well," he says. And observations show that the insects do not shift in height as the day progresses and the light patterns change. Worse still, according to DeVries, this theory doesn't explain why the model species is flying at that particular height in the first place

F. "When I first went out to Ecuador, I didn't believe the flight height hypothesis and set out to test it," says Beccaloni. "A few weeks with the collecting net convinced me otherwise. They really flew that way." What he didn't accept, however, was the explanation about light patterns. "I thought, if this idea really is true, and I can work out why, it could help explain why there are so many different warning patterns in any one place. Then we might finally understand how they could evolve in such a complex way." The job was complicated by the sheer diversity of species involved at Jatun Sacha. Not only were there 56 ithomiine butterfly species divided among eight mimicry rings, there were also 69 other insect species, including 34 day-flying moths and a damselfly, all in a 200-hectare study area. Like many entomologists before him, Beccaloni used a large bag-like net to capture his prey. This allowed him to sample the 2.5 metres immediately above the forest floor. Unlike many previous workers, he kept very precise notes on exactly where he caught his specimens

G. The attention to detail paid off. Beccaloni found that the mimicry rings were flying at two quite separate altitudes. "Their use of the forest was quite distinctive," he recalls. "For example, most members of the clear-winged mimicry ring would fly close to the forest floor, while the majority of the 12 species in the tiger-winged ring fly high up." Each mimicry ring had its own characteristic flight height.

H. However, this being practice rather than theory, things were a bit fuzzy. "They'd spend the majority of their time flying at a certain height. But they'd also spend a smaller proportion of their time flying at other heights," Beccaloni admits. Species weren't stacked rigidly like passenger jets waiting to land, but they did appear to have a preferred airspace in the forest. So far, so good, but he still hadn't explained what causes the various groups of ithomiines and their chromatic consorts to fly in formations at these particular heights.

I. Then Beccaloni had a bright idea. "I started looking at the distribution of ithomiine larval food plants within the canopy," he says. "For each one I'd record the height to which the host plant grew and the height above the ground at which the eggs or larvae were found. Once I got them back to the field station's lab, it was just a matter of keeping them alive until they pupated and then hatched into adults which I could identify."

Questions 28-32

The Reading Passage 3 has seven paragraphs A-I. Which paragraph contains the following information? Write the correct letter A-I, in boxes 28-32 on your answer sheet. NB You may use any letter more than once.

28. Criticism against flight height theory of butterfly.
29. Explained why Beccaloni carried out research in Ecuador.
30. Different mimicry ring flies at different height.
31. The method of catching butterfly by Beccaloni.
32. Not all Mimicry patterns are toxic information sent out from insects.

Questions 33-38

Do the following statements agree with the Information given in Reading Passage 1
In boxes 33-38 on your answer sheet, write

- | | |
|------------------|--|
| TRUE | If the statement is true |
| FALSE | If the statement is false |
| NOT GIVEN | If the Information is not given in the passage |

33. All butterflies' colour of wing reflect the sense of warning to other predator.
34. Insects may imitate butterflies' wing pattern as well.
35. Flying Altitude of butterfly is determined by their food.
36. Beccaloni agreed with flight height hypothesis and decide to reassure its validity.
37. Jatun Sacha has the riches diversity of breeds in the world.
38. Beccaloni has more detailed records on the location of butterfly collection than others.

Questions 39-40

Choose the correct letter, A, B, C or D. Write your answers in boxes 39-40 on your answer sheet.

39. Which is correct about butterflies flight altitude?
 - A) Flight height theory already established.
 - B) Butterfly always flies at a certain height
 - C) It is like the airplane's flying phenomenon
 - D) Each butterfly has its own favorable height
40. Which is correct about Beccaloni next investigation after flight height?
 - A) Some certain statistics have already been collected
 - B) Try to find connections between larval height and adult ones
 - C) It's very difficult to raise butterfly larval
 - D) Different larval favors different kinds of trees

Reading 30
PASSAGE 1

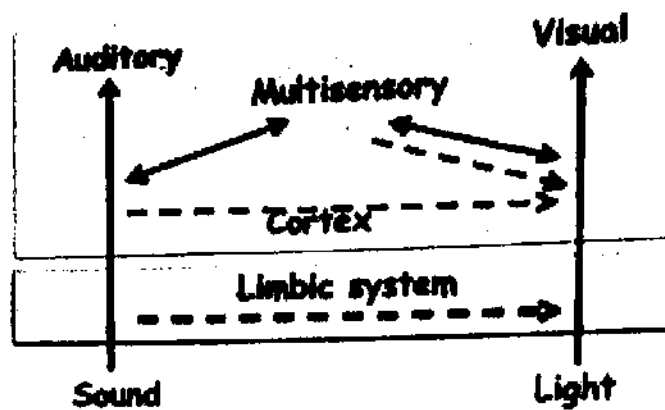
THE DECODING OF MEMORY

Try this memory test: Study each face and compose a vivid image for the person's first and last name. Rose Leo, for example, could be a rosebud and a lion. Fill in the blanks on the next page. The Examinations School at Oxford University is an austere building of oak-paneled rooms, large Gothic windows, and looming portraits of eminent dukes and earls. It is where generations of Oxford students have tested their memory on final exams, and it is where, last August, 34 contestants gathered at the World Memory Championships to be examined in an entirely different manner.

A In timed trials, contestants were challenged to look at and then recite a two-page poem, memorize rows of 40-digit numbers, recall the names of 110 people after looking at their photographs, and perform seven other feats of extraordinary retention. Some tests took just a few minutes; others lasted hours. In the 14 years since the World Memory Championships was founded, no one has memorized the order of a shuffled deck of playing cards in less than 30 seconds. That nice round number has become the four-minute mile of competitive memory, a benchmark that the world's best "mental athletes," as some of them like to be called, are closing in on. Most contestants claim to have just average memories, and scientific testing confirms that they're not just being modest. Their feats are based on tricks that capitalize on how the human brain encodes information. Anyone can learn them.

B Psychologists Elizabeth Valentine and John Wilding, authors of the monograph *Superior Memory*, recently teamed up with Eleanor Maguire, a neuroscientist at University College London to study eight people, including Karsten, who had finished near the top of the World Memory Championships. They wondered if the contestants' brains were different in some way. The researchers put the competitors and a group of control subjects into an MRI machine and asked them to perform several different memory tests while their brains were being scanned. When it came to memorizing sequences of three-digit numbers, the difference between the memory contestants and the control subjects was, as expected, immense. However, when they were shown photographs of magnified snowflakes, images that the competitors had never tried to memorize before, the champions did no better than the control group. When the researchers analyzed the brain scans, they found that the memory champs were activating some brain regions that were different from those the control subjects were using. These regions, which included the right posterior hippocampus, are known to be involved in visual memory and spatial navigation.

C It might seem odd that the memory contestants would use visual imagery and spatial navigation to remember numbers, but the activity makes sense when their techniques are revealed. Cooke, a 23-year-old cognitive-science graduate student with a shoulder-length mop of curly hair, is a grand master of brain storage. He can memorize the order of 10 decks of playing cards in less than an hour or one deck of cards in less than a minute. He is closing in on the 30-second deck. In the Lamb and Flag, Cooke pulled out a deck of cards and shuffled it. He held up three cards—the 7 of spades, the queen of clubs, and the 10 of spades. He pointed at a fireplace and said "Destiny's Child is whacking Franz Schubert with handbags." The next three cards were the king of hearts, the king of spades, and the jack of clubs.



D How did he do it? Cooke has already memorized a specific person, verb, and object that he associates with each card in the deck. For example, for the 7 of spades, the person (or, in this case, persons) is always the singing group Destiny's Child the action is surviving a storm, and the image is a dinghy. The queen of clubs is always his friend Henrietta, the action is thwacking with a handbag, and the image is of wardrobes filled with designer clothes. When Cooke commits a deck to memory, he does it three cards at a time. Every three-card group forms a single image of a person doing something to an object. The first card in the triplet becomes the person, the second the verb, the third the object. He then places those images along a specific familiar route, such as the one he took through the Lamb and Flag. In competitions, he uses an imaginary route that he has designed to be as smooth and downhill as possible. When it comes time to recall Cooke takes a mental walk along his route and translates the images into cards. That's why the MRIs of the memory contestants showed activation in the brain areas associated with visual imagery and spatial navigation.

E The more resonant the images are, the more difficult they are to forget. But even meaningful information is hard to remember when there's a lot of it. That's why competitive memorizers place their images along an imaginary route. That technique, known as the loci method reportedly originated in 477 B.C. with the Greek poet Simonides of Ceos. Simonides was the sole survivor of a roof collapse that killed all the other guests at a royal banquet. The bodies were mangled beyond recognition, but Simonides was able to reconstruct the guest list by closing his eyes and recalling each individual around the dinner table. What he had discovered was that our brains are exceptionally good at remembering images and spatial information. Evolutionary psychologists have offered an explanation: Presumably our ancestors found it important to recall where they found their last meal or the way back to the cave. After Simonides' discovery, the loci method became popular across ancient Greece as a trick for memorizing speeches and texts. Aristotle wrote about it, and later a number of treatises on the art of memory were published in Rome. Before printed books, the art of memory was considered a staple of classical education, on a par with grammar, logic, and rhetoric.

F The most famous of the naturals was the Russian journalist S.V. Shereshevski, who could recall long lists of numbers memorized decades earlier, as well as poems, strings of nonsense syllables, and just about anything else he was asked to remember. "The capacity of his memory had no distinct limits," wrote Alexander Luria, the Russian psychologist who studied Shereshevski from the 1920s to the 1950s. Shereshevski also had synesthesia, a rare condition in which the senses become intertwined. For example, every number may be associated with a color or every word

with a taste. Synesthetic reactions evoke a response in more areas of the brain, making memory easier.

G. K. Anders Ericsson, a Swedish-born psychologist at Florida State University, thinks anyone can acquire Shereshevski's skills. He cites an experiment with S. F., an undergraduate who was paid to take a standard test of memory called the digit span for one hour a day, two or three days a week. When he started, he could hold, like most people, only about seven digits in his head at any given time (conveniently, the length of a phone number). Over two years, S. F. completed 250 hours of testing. By then, he had stretched his digit span from 7 to more than 80. The study of S. F. led Ericsson to believe that innately superior memory doesn't exist at all. When he reviewed original case studies of naturals, he found that exceptional memorizers were using techniques—sometimes without realizing it—and lots of practice. Often, exceptional memory was only for a single type of material, like digits. "If we look at some of these memory tasks, they're the kind of thing most people don't even waste one hour practicing, but if they wasted 50 hours, they'd be exceptional at it," Ericsson says. It would be remarkable, he adds, to find a "person who is exceptional across a number of tasks. I don't think that there's any compelling evidence that there are such people."

Questions 1-5

The reading Passage has seven paragraphs A-G. Which paragraph contains the following information? Write the correct letter A-G, in boxes 1-5 on your answer sheet.

1. The reason why competence of super memory is significant in academic settings
2. Mention of a contest for extraordinary memory held in consecutive years.
3. An demonstrative example of extraordinary person did an unusual recalling game.
4. A belief that extraordinary memory can be gained though enough practice.
5. A depiction of rare ability which assist the extraordinary memory reactions.

Questions 6-10

Complete the following summary of the paragraphs of Reading Passage, using **NO MORE THAN THREE WORDS** from the Reading Passage for each answer.

Write your answers in boxes 6-10 on your answer sheet.

Using visual imagery and spatial navigation to remember numbers are investigated and explained. A man called Ed Cooke in a pub, spoke a string of odd words when he held 7 of the spades (the first one of the any cards group) was remembered as he encoded it to a 6 _____ and the card deck to memory are set to be one time of a order of 7 _____; When it comes time to recall, Cooke took a 8 _____ along his way and interpreted the imaginary scene into cards. This superior memory skill can be traced back to Ancient Greece, the strategy was called 9 _____ which had been a major subject was in ancient 10 _____.

Questions 11-12

Choose TWO correct letters, A–E. Write your answers in boxes 11-12 on your answer sheet.

According to World Memory Championships, what activities need good memory?

- A) order for a large group of each digit
- B) recall people's face
- C) resemble a long Greek poem
- D) match name with pictures and features
- E) recall what people ate and did yesterday

Questions 13-14

Choose TWO correct letters, A–E. Write your answers in boxes 13-14 on your answer sheet.

What is the result of Psychologists Elizabeth Valentine and John Wilding's MRI Scan experiment find out?

- A. the champions' brains is different in some way from common people
- B. difference in brain of champions' scan image to control subjects are shown when memorizing sequences of three-digit numbers
- C. champions did much worse when they are asked to remember photographs
- D. the memory-champs activated more brain regions than control subjects
- E. there is some part in the brain coping with visual and spatial memory

PASSAGE 2

ACTIVITIES FOR THE FITNESS OF CHILDREN

- A Twenty-five years ago, children in London walked to school and played in parks and playing fields after school and at the weekend. Today they are usually driven to school by parents anxious about safety and spend hours glued to television screens or computer games. Meanwhile, community playing fields are being sold off to property developers at an alarming rate. 'This change in lifestyle has, sadly, meant greater restrictions on children,' says Neil Armstrong, Professor of Health and Exercise Sciences at the University of Exeter. 'If children continue to be this inactive, they'll be storing up big problems for the future.'
- B In 1985, Professor Armstrong headed a five-year research project into children's fitness. The results, published in 1990, were alarming. The survey, which monitored 700 11-16-year-olds, found that 48 per cent of girls and 41 percent of boys already exceeded safe cholesterol levels set for children by the American Heart Foundation. Armstrong adds, "heart is a muscle and need exercise, or it loses its strength." It also found that 13 per cent of boys and 10 per cent of girls were overweight. More disturbingly, the survey found that over a four-day period, half the girls and one-third of the boys did less exercise than the equivalent of a brisk 10-minute walk. High levels of cholesterol, excess body fat and inactivity are believed to increase the risk of coronary heart disease.

- C Physical education is under pressure in the UK - most schools devote little more than 100 minutes a week to it in curriculum time, which is less than many other European countries. Three European countries are giving children a head start in PE, France, Austria and Switzerland - offer at least two hours in primary and secondary schools. These findings, from the European Union of Physical Education Associations, prompted specialists in children's physiology to call on European governments to give youngsters a daily PE programme. The survey shows that the UK ranks 13th out of the 25 countries, with Ireland bottom, averaging under an hour a week for PE. From age six to 18, British children received, on average, 106 minutes of PE a week. Professor Armstrong, who presented the findings at the meeting, noted that since the introduction of the national curriculum there had been a marked fall in the time devoted to PE in UK schools, with only a minority of pupils getting two hours a week.
- D As a former junior football international, Professor Armstrong is a passionate advocate for sport. Although the Government has poured millions into beefing up sport in the community, there is less commitment to it as part of the crammed school curriculum. This means that many children never acquire the necessary skills to thrive in team games. If they are no good at them, they lose interest and establish an inactive pattern of behaviour. When this is coupled with a poor diet, it will lead inevitably to weight gain. Seventy per cent of British children give up all sport when they leave school, compared with only 20 per cent of French teenagers. Professor Armstrong believes that there is far too great an emphasis on team games at school. "We need to look at the time devoted to PE and balance it between individual and pair activities, such as aerobics and badminton, as well as team sports." He added that children need to have the opportunity to take part in a wide variety of individual, partner and team sports.
- E The good news, however, is that a few small companies and children's activity groups have reacted positively and creatively to the problem. Take That, shouts Gloria Thomas, striking a disco pose astride her mini-spacehopper. Take That, echo a flock of toddlers, adopting outrageous postures astride their space hoppers. 'Michael Jackson, she shouts, and they all do a spoof fan-crazed shriek. During the wild and chaotic hopper race across the studio floor, commands like this are issued and responded to with untrammelled glee. The sight of 15 bouncing seven-year-olds who seem about to launch into orbit at every bounce brings tears to the eyes. Uncoordinated, loud, excited and emotional, children provide raw comedy.
- F Any cardiovascular exercise is a good option, and it doesn't necessarily have to be high intensity. It can be anything that gets your heart rate up: such as walking the dog, swimming, miming, skipping, hiking. "Even walking through the grocery store can be exercise," Samis-Smith said. What they don't know is that they're at a Fit Kids class, and that the fun is a disguise for the serious exercise plan they're covertly being taken through. Fit Kids trains parents to run fitness classes for children. 'Ninety per cent of children don't like team sports,' says company director, Gillian Gale.

- G A Prevention survey found that children whose parents keep in shape are much more likely to have healthy body weights themselves. "There's nothing worse than telling a child what he needs to do and not doing it yourself," says Elizabeth Ward, R.D., a Boston nutritional consultant and author of *Healthy Foods, Healthy Kids*. "Set a good example and get your nutritional house in order first." In the 1930s and '40s, kids expended 800 calories a day just walking, carrying water, and doing other chores, notes Fima Lifshitz, M.D., a pediatric endocrinologist in Santa Barbara. "Now, kids in obese families are expending only 200 calories a day in physical activity," says Lifshitz, "incorporate more movement in your family's lifepark farther away from the stores at the mall, take stairs instead of the elevator, and walk to nearby friends' houses instead of driving."

Questions 15 -18

The reading Passage has seven paragraphs A-G. Which paragraph contains the following information? Write the correct letter A-G, in boxes 15-18 on your answer sheet.

15. Health and living condition of children
16. Health organization monitored physical activity
17. Comparison of exercise time between UK and other countries
18. Wrong approach for school activity

Questions 19-22

Do the following statements agree with the information given in Reading Passage 2? In boxes 19-22 on your answer sheet, write

- | | |
|------------------|--|
| TRUE | if the statement is true |
| FALSE | if the statement is false |
| NOT GIVEN | if the information is not given in the passage |

19. According to American Heart Foundation, cholesterol levels of boys are higher than girls'.
20. British children generally do less exercise than some other European countries.
21. Skipping becomes more and more popular in schools of UK.
22. According to *Healthy Kids*, the first task is for parents to encourage their children to keep the same healthy body weight.

Questions 23-27

Choose the correct letter, **A, B, C** or **D**. Write your answers in boxes 23-27 on your answer sheet.

23. According to paragraph A, what does Professor Neil Armstrong concern about?

- A) Spending more time on TV affect academic level
- B) Parents have less time stay with their children
- C) Future health of British children
- D) Increasing speed of property's development

24. What does Armstrong indicate in Paragraph B?

- A) We need to take a 10 minute walk everyday
- B) We should do more activity to exercise heart
- C) Girls' situation is better than boys
- D) Exercise can cure many disease

25. What is aim of First Kids' training?

- A) Make profit by running several sessions
- B) Only concentrate on one activity for each child
- C) To guide parents how to organize activities for children
- D) Spread the idea that team sport is better

26. What did Lifshitz suggest in the end of this passage?

- A) Create opportunities to exercise your body
- B) Taking elevator saves your time
- C) Kids should spend more than 200 calories each day
- D) We should never drive but walk

27. What is main idea of this passage?

- A) Health of the children who are overweight is at risk in the future
- B) Children in UK need proper exercises
- C) Government mistaken approach for children
- D) Parents play the most important role in children's activity

PASSAGE 3

LINGUISTIC CHANGE AND ITS MECHANISMS

A The changes that have caused the most disagreement are those in pronunciation. We have various sources of evidence for the pronunciations of earlier times, such as the spellings, the treatment of words borrowed from other languages or borrowed by them, the descriptions of contemporary grammarians and spelling-reformers, and the modern pronunciations in all the languages and dialects concerned. From the middle of the sixteenth century, there are in England writers who attempt to describe the position of the speech-organs for the production of English phonemes, and who invent what are in effect systems of phonetic symbols. These various kinds of evidence, combined with a knowledge of the mechanisms of speech-production, can often give us a very good idea of the pronunciation of an earlier age, though absolute certainty is never possible.

B When we study the pronunciation of a language over any period of a few generations or more, we find there are always large-scale regularities in the changes: for example, over a certain period of time, just about all the long [a:] vowels in a language may change into long [e:] vowels, or all the [b] consonants in a certain position (for example at the end of a word) may change into [p] consonants. Such regular changes are often called sound laws. There are no universal sound laws (even though sound laws often reflect universal tendencies), but simply particular sound laws for one given language (or dialect) at one given period.

C It is also possible that fashion plays a part in the process of change. It certainly plays a part in the spread of change: one person imitates another, and people with the most prestige are most likely to be imitated, so that a change that takes place in one social group may be imitated (more or less accurately) by speakers in another group. When a social group goes up or down in the world, its pronunciation of Russian, which had formerly been considered desirable, became on the contrary an undesirable kind of accent to have, so that people tried to disguise it. Some of the changes in accepted English pronunciation in the seventeenth and eighteenth centuries have been shown to consist in the replacement of one style of pronunciation by another style already existing, and it is likely that such substitutions were a result of the great social changes of the period: the increased power and wealth of the middle classes, and their steady infiltration upwards into the ranks of the landed gentry, probably carried elements of middle-class pronunciation into upper-class speech.

D A less specific variant of the argument is that the imitation of children is imperfect: they copy their parents' speech, but never reproduce it exactly. This is true, but it is also true that such deviations from adult speech are usually corrected in later childhood. Perhaps it is more significant that even adults show a certain amount of random variation in their pronunciation of a given phoneme, even if the phonetic context is kept unchanged. This, however, cannot explain changes in pronunciation unless it can be shown that there is some systematic trend in the failures

of imitation: if they are merely random deviations they will cancel one another out and there will be no net change in the language.

E One such force which is often invoked is the principle of ease, or minimization of effort. The change from fussy to fuzzy would be an example of assimilation, which is a very common kind of change. Assimilation is the changing of a sound under the influence of a neighbouring one. For example, the word scant was once skamt, but the /m/ has been changed to /n/ under the influence of the following /t/. Greater efficiency has hereby been achieved, because /n/ and /t/ are articulated in the same place (with the tip of the tongue against the teeth-ridge), whereas /m/ is articulated elsewhere (with the two lips). So the place of articulation of the nasal consonant has been changed to conform with that of the following plosive. A more recent example of the same kind of thing is the common pronunciation of football as football.

F Assimilation is not the only way in which we change our pronunciation in order to increase efficiency. It is very common for consonants to be lost at the end of a word: in Middle English, word-final [-n] was often lost in unstressed syllables, so that baken 'to bake' changed from ['ba:kan] to ['ba:k3], and later to [ba:k]. Consonant-clusters are often simplified. At one time there was a [t] in words like castle and Christmas, and an initial [k] in words like knight and know. Sometimes a whole syllable is dropped out when two successive syllables begin with the same consonant (haplology): a recent example is temporary, which in Britain is often pronounced as if it were temporary.

Questions 28-31

Complete the summary below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 28-31 on your answer sheet.

The pronunciation of living language undergo changes throughout thousands of years. Large scale regular changes are usually called 28 _____. There are three reasons for these changes. Firstly, the influence of one language on another; when one person imitates another pronunciation (the most prestige's), the imitation always partly involving factor of 29 _____. Secondly, the imitation of children from adults' language sometimes are 30 _____, and may also contribute to this change if there are insignificant deviations though later they may be corrected. Finally, for those random variations in pronunciation, the deeper evidence lies in the 31 _____ or minimization of effort.

Questions 32-38

Do the following statements agree with the information given in Reading Passage 3? In boxes 32-38 on your answer sheet, write

- TRUE** if the statement is true
FALSE if the statement is false
NOT GIVEN if the information is not given in the passage

32. It is impossible for modern people to find pronunciation of words in an earlier age
33. The great change of language in Russian history is related to the rising status and fortune of middle classes.
34. All the children learn speeches from adults while they assume that certain language is difficult to imitate exactly.
35. Pronunciation with causal inaccuracy will not exert big influence on language changes.
36. The word 'scant' can be more easily pronounced than 'skamt'.
37. The [g] in gnat not being pronounced will not be spelt out in the future.
38. The sound of 'temporary' cannot wholly present its spelling.

Questions 39-41

Look at the following sentences and the list of statements below. Match each statement with the correct sentence, A-D.

Write the correct letter, A-D, in boxes 39-41 on your answer sheet

- A Since the speakers can pronounce it with less effort
B Assimilation of a sound under the influence of a neighbouring one
C It is a trend for changes in pronunciation in a large scale in a given period.
D Because the speaker can pronounce [n] and [t] both in the same time

39. As a consequence, 'b' will be pronounced as
40. The pronunciation of [mt] changed to [nt]
41. The omit of 't' in the sound of Christmas

Reading 31
PASSAGE 1

CHILDHOOD AND ITS CONCEPT IN THE WEST

The history of childhood has been a topic of interest in social history since the highly influential 1960 book *Centuries of Childhood*, written by French historian Philippe Aries. He argued that "childhood" is a concept created by modern society.

A One of the most hotly debated issues in the history of childhood has been whether childhood is itself a recent invention. The historian Philippe Aries argued that in Western Europe during the Middle Ages (up to about the end of the fifteenth century) children were regarded as miniature adults, with all the intellect and personality that this implies. He scrutinized medieval pictures and diaries, and found no distinction between children and adults as they shared similar leisure activities and often the same type of work. Aries, however, pointed out that this is not to suggest that children were neglected, forsaken or despised. The idea of childhood is not to be confused with affection for children; it corresponds to an awareness of the particular nature of childhood, that particular nature which distinguishes the child from the adult, even the young adult.

B There is a long tradition of the children of the poor playing a functional role in contributing to the family income by working either inside or outside the home. In this sense children are seen as 'useful'. Back in the Middle Ages, children as young as 5 or 6 did important chores for their parents and, from the sixteenth century, were often encouraged (or forced) to leave the family by the age of 9 or 10 to work as servants for wealthier families or to be apprenticed to a trade.

C With industrialization in the eighteenth and nineteenth centuries, a new demand for child labour was created, and many children were forced to work for long hours, in mines, workshops and factories. Social reformers began to question whether labouring long hours from an early age would harm children's growing bodies. They began to recognize the potential of carrying out systematic studies to monitor how far these early deprivations might be affecting children's development.

D Gradually, the concerns of the reformers began to impact on the working conditions of children. In Britain, the Factory Act of 1833 signified the beginning of legal protection of children from exploitation and was linked to the rise of schools for factory children. The worst forms of child exploitation were gradually eliminated, partly through factory reform but also through the influence of trade unions and economic changes during the nineteenth century which made some forms of child labour redundant. Childhood was increasingly seen as a time for play and education for all children, not just for a privileged minority. Initiating children into work as 'useful' children became less of a priority. As the age for starting full-time work was delayed, so childhood was increasingly understood as a more extended phase of dependency, development and learning. Even so, work continued to play a significant, if less central role in children's lives throughout the

later nineteenth and twentieth century. And the 'useful child, has become a controversial image during the first decade of the twenty-first century especially in the context of global concern about large numbers of the world's children engaged in child labour.

E The Factory Act of 1833 established half-time schools which allowed children to work and attend school. But in the 1840s, a large proportion of children never went to school, and if they did, they left by the age of 10 or 11. The situation was very different by the end of the nineteenth century in Britain. The school became central to images of a normal childhood.

F Attending school was no longer a privilege and all children were expected to spend a significant part of their day in a classroom. By going to school, children's lives were now separated from domestic life at home and from the adult world of work. School became an institution dedicated to shaping the minds, behaviour and morals of the young. Education dominated the management of children's waking hours, not just through the hours spent in classrooms but through home work, the growth of after school activities and the importance attached to 'parental involvement.'

G Industrialization, urbanization and mass schooling also set new challenges for those responsible for protecting children's welfare, and promoting their learning. Increasingly, children were being treated as a group with distinctive needs and they were organized into groups according to their age. For example, teachers needed to know what to expect of children in their classrooms, what kinds of instruction were appropriate for different age groups and how best to assess children's progress. They also wanted tools that could enable them to sort and select children according to their abilities and potential.

Questions 1-7

Do the following statements agree with the information given in Reading Passage 3? Write your answers in boxes 1-7 on your answer sheet.

TRUE

if the statement is true

FALSE

if the statement is false

NOT GIVEN

if the information is not given in the passage

1. Aries pointed out that children did different types of work as adults during the Middle Age.
2. During the Middle Age, going to work necessarily means children were unloved indicated by Aries.
3. Scientists think that overworked labour damages the health of young children
4. The rise of trade union majorly contributed to the protection children from exploitation in 19th century
5. By the aid of half-time schools, most children went to school in the mid of 19 century.
6. In 20 century almost all children need to go to school in full time schedule.
7. Nowadays, children's needs were much differentiated and categorised based on how old they are

Questions 8-13

Answer the questions below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 8-10 on your answer sheet.

8. What is the controversial topic arises with the French historian Philippe Aries's concept
9. What image for children did Aries believed to be like in Western Europe during the Middle Ages?
10. What historical event generated the need for great amount child labour to work long time in 18 and 19 century?
11. What legal format initiated the protection of children from exploitation in 19th century
12. What the activities were more and more regarded as being preferable for almost all children time in 19th century
13. Where has been the central area for children to spend largely of their day as people's expectation in modern society

PASSAGE 2

CHINESE CHARIOTS OF THE ANCIENT TIMES

A The Shang Dynasty or Yin Dynasty, according to traditional historiography, ruled in the Yellow River valley in the second millennium. Archaeological work at the Ruins of Yin (near modern-day Anyang), which has been identified as the last Shang capital, uncovered eleven major Yin royal tombs and the foundations of palaces and ritual sites, containing weapons of war and remains from both animal and human sacrifices.

B The Tomb of Fu Hao is an archaeological site at Yinxu, the ruins of the ancient Shang Dynasty capital Yin, within the modern city of Anyang in Henan Province, China. Discovered in 1976, it was identified as the final resting place of the queen and military general Fu Hao. The artifacts unearthed within the grave included jade objects, bone objects, bronze objects etc. These grave goods are confirmed by the oracle texts, which constitute almost all of the first hand written record we possess of the Shang Dynasty. Below the corpse was a small pit holding the remains of six sacrificial dogs and along the edge lay the skeletons of human slaves, evidence of human sacrifice.

C The Terracotta Army was discovered on 29 March 1974 to the east of Xi'an in Shaanxi. The terracotta soldiers were accidentally discovered when a group of local farmers was digging a well during a drought around 1.6 km (1 mile) east of the Qin Emperors tomb around at Mount Li (Lishan), a region riddled with underground springs and watercourses. Experts currently place the entire number of soldiers at 8,000 — with 130 chariots (130 cm long), 530 horses and 150 cavalry horses helping toward of any dangers in the afterlife. In contrast, the burial of Tutankhamun yielded six complete but dismantled chariots of unparalleled richness and sophistication. Each was designed for two people (90 cm long) and had its axle sawn through to enable it to be brought along the narrow corridor into the tomb.

D Excavation of ancient Chinese chariots has confirmed the descriptions of them in the earliest texts. Wheels were constructed from a variety of woods: elm provided the hub, rosewood the spokes and oak the felloes. The hub was drilled through to form an empty space into which the tapering axle was fitted, the whole being covered with leather to retain lubricating oil. Though the number of spokes varied, a wheel by the fourth century BC usually had eighteen to thirty-two of them. Records show how elaborate was the testing of each completed wheel: flotation and weighing were regarded as the best measures of balance, but even the empty spaces in the assembly were checked with millet grains. One outstanding constructional asset of the ancient Chinese wheel was dishing. Dishing refers to the dish-like shape of an advanced wooden wheel, which looks rather like a flat cone. On occasion they chose to strengthen a dished wheel with a pair of struts running from rim to rim on each of the hub. As these extra supports were inserted separately into the felloes, they would have added even greater strength to the wheel. Leather wrapped up the edge of the wheel aimed to retain bronze.

E Within a millennium, however, Chinese chariot-makers had developed a vehicle with shafts, the precursor of the true carriage or cart. This design did not make its appearance in Europe until the end of the Roman Empire. Because the shafts curved upwards, and the harness pressed against a horse's shoulders, not his neck, the shaft chariot was incredibly efficient. The halberd was also part of chariot standard weaponry. This halberd usually measured well over 3 metres in length, which meant that a chariot warrior wielding it sideways could strike down the charioteer in a passing chariot. The speed of chariot which was tested on the sand was quite fast. At speed these passes were very dangerous for the crews of both chariots.

F The advantages offered by the new chariots were not entirely missed. They could see how there were literally the warring states, whose conflicts lasted down the Qin unification of China. Qin Shi Huang was buried in the most opulent tomb complex ever constructed in China, a sprawling, city-size collection of underground caverns containing everything the emperor would need for the afterlife. Even a collection of terracotta armies called Terra- Cotta Warriors was buried in it. The ancient Chinese, along with many cultures including ancient Egyptians, believed that items and even people buried with a person could be taken with him to the afterlife.

Questions 14 -17

Do the following statements agree with the information given in Reading Passage 1? In boxes 14-17 on your answer sheet, write

- TRUE** if the statement is true
FALSE if the statement is false
NOT GIVEN if the information is not given in the passage

14. When discovered, the written records of the grave goods proved to be accurate.
15. Human skeletons in Anyang tomb were identified as soldiers who were killed in the war.
16. The Terracotta Army was discovered by people who lived nearby by chance.
17. The size of the King Tutankhamen's tomb is bigger than that of Qin Emperors' tomb.

Questions 18-23

Complete the notes below. Choose **ONE WORD** from the passage for each answer. Write your answers in boxes 18-23 on your answer sheet.

18. The hub is made wood from the tree of _____.
19. The room through the hub was to put tempering axle in which is wrapped up by leather aiming to retain _____.
20. The number of spokes varied from _____ to _____.
21. The shape of wheel resembles a _____.
22. Two was used to strengthen the wheel _____.
23. Leather wrapped up the edge of the wheel aimed to remain _____.

Questions 24-26

Answer the questions below. Choose **NO MORE THAN THREE WORDS AND/OR A NUMBER** from the passage for each answer.

24. What body part of horse was released the pressure from to the shoulder?
25. What kind road surface did the researchers measure the speed of the chariot?
26. What part of his afterlife palace was the Emperor Qin Shi Huang buried?

PASSAGE 3

CONSERVING THE BRITISH BITTERNS

A Breeding bitterns became extinct in the UK by 1886 but, following re-colonisation early last century, numbers rose to a peak of about 70 booming (singing) males in the 1950s, falling to fewer than 20 by the 1990s. In the late 1980s it was clear that the bittern was in trouble, but there was little information on which to base recovery actions.

B Bitterns have cryptic plumage and a shy nature, usually remaining hidden within the cover of reedbed vegetation. Our first challenge was to develop standard methods to monitor their numbers. The boom of the male bittern is its most distinctive feature during the breeding season, and we developed a method to count them using the sound patterns unique to each individual. This not only allows us to be much more certain of the number of booming males in the UK, but also enables us to estimate local survival of males from one year to the next.

C Our first direct understanding of the habitat needs of breeding bitterns came from comparisons of reedbed sites that had lost their booming birds with those that retained them. This research showed that bitterns had been retained in reedbeds where the natural process of succession, or drying out, had been slowed through management. Based on this work, broad recommendations on how to manage and rehabilitate reed beds for bitterns were made, and funding was provided through the EU LIFE Fund to manage 13 sites within the core breeding range. This project, though led by the RSPB, involved many other organisations.

D To refine these recommendations and provide fine-scale, quantitative habitat prescriptions on the bitterns preferred feeding habitat, we radio-tracked male bitterns on the RSPB's Minsmere and Leighton Moss reserves. This showed clear preferences for feeding in the wetter reedbed margins, particularly within the reedbed next to larger open pools. The average home range sizes of the male bitterns we followed (about 20 hectares) provided a good indication of the area of reedbed needed when managing or creating habitat for this species. Female bitterns undertake all the incubation and care of the young, so it was important to understand their needs as well. Over the course of our research, we located 87 bittern nests and found that female bitterns preferred to nest in areas of continuous vegetation, well into the reedbed, but where water was still present during the driest part of the breeding season.

E The success of the habitat prescriptions developed from this research has been spectacular. For instance, at Minsmere, booming bittern numbers gradually increased from one to 10 following reedbed lowering, a management technique designed to halt the drying out process. After a low point of 11 booming males in 1997, bittern numbers in Britain responded to all the habitat management work and started to increase for the first time since the 1950s.

F The final phase of research involved understanding the diet, survival and dispersal of bittern chicks. To do this we fitted small radio tags to young bittern chicks in the nest, to determine their fate through to fledging and beyond. Many chicks did not survive to fledging and starvation was found to be the most likely reason for their demise. The fish prey fed to chicks was dominated by those species penetrating into the reed edge. So, an important element of recent studies (including a PhD with the University of Hull) has been the development of recommendations on habitat and water conditions to promote healthy native fish populations

G Once independent, radio-tagged young bitterns were found to seek out new sites during their first winter; a proportion of these would remain on new sites to breed if the conditions were suitable. A second EU LIFE funded project aims to provide these suitable sites in new areas. A network of 19 sites developed through this partnership project will secure a more sustainable UK bittern population with successful breeding outside of the core area, less vulnerable to chance events and sea level rise.

H By 2004, the number of booming male bitterns in the UK had increased to 55, with almost all of the increase being on those sites undertaking management based on advice derived from our research. Although science has been at the core of the bittern story, success has only been achieved through the trust, hard work and dedication of all the managers, owners and wardens of sites that have implemented, in some cases very drastic, management to secure the future of this wetland species in the UK. The constructed bunds and five major sluices now control the water level over 82 ha, with a further 50 ha coming under control in the winter of 2005/06. Reed establishment has principally used natural regeneration or planted seedlings to provide small core areas that will in time expand to create a bigger reed area. To date nearly 275,000 seedlings have been planted and reed cover is extensive. Over 3 km of new ditches have been formed, 3.7 km of existing ditch have been re-profiled and 2.2 km of old meander (former estuarine features) has been cleaned out.

I Bitterns now regularly winter on the site some indication that they are staying longer into the spring. No breeding has yet occurred but a booming male was present in the spring of 2004. A range of wildfowl breed, as well as a good number of reedbed passerines including reed bunting, reed, sedge and grasshopper warblers. Numbers of wintering shoveler have increased so that the site now holds a UK important wintering population. Malltraeth Reserve now forms part of the UK network of key sites for water vole (a UK priority species) and 12 monitoring transects has been established. Otter and brown-hare occur on the site as does the rare plant. Pillwort.

Questions 27-33

The reading passage has seven paragraphs, A-H. Choose the correct heading for paragraphs A-H from the list below. Write the correct number, i-ix, in boxes 27-33 on your answer sheet.

List of Headings

- i. research findings into habitats and decisions made
- ii. fluctuation in bittern number
- iii. protect the young bittern
- iv. international cooperation works
- v. Began in calculation of the number
- vi. importance of food
- vii. Research has been successful,
- viii. research into the reedbed
- ix. reserve established holding bittern in winter

27. Paragraph A

28. Paragraph B

29. Paragraph C

30. Paragraph D

31. Paragraph F

32. Paragraph G

33. Paragraph H

Example: Paragraph E vii

Questions 34-39

Answer the questions below. Choose **NO MORE THAN THREE WORDS AND/OR A NUMBER** from the passage for each answer.

- 34. When did the bird of bittern reach its peak of number?
- 35. What does the author describe the bittern's character?
- 36. What is the main cause for the chick bittern's death?
- 37. What is the main food for chick bittern?
- 38. What system does it secure the stability for bittern's population?
- 39. Besides bittern and rare vegetation, what mammal does the plan benefit?

Question 40

Choose the correct letter, A, B, C or D.

Write your answers in boxes 40 on your answer sheet.

40. What is the main purpose of this passage?
- A) Main characteristic of a bird called bittern.
 - B) Cooperation can protect an endangered species.
 - C) The difficulty of access information of bittern's habitat and diet.
 - D) To save wetland and reedbed in UK.

READING 32

PASSAGE 1

E-LEARNING

- A. E-learning is the unifying term to describe the fields of online learning, web-based training, and technology-delivered instruction, which can be a great benefit to corporate e-learning. IBM, for instance, claims that the institution of its e-training program, Basic Blue, whose purpose is to train new managers, saved the company in the range of \$200 million in 1999. Cutting the travel expenses required to bring employees and instructors to a central classroom accounts for the lion's share of the savings. With an online course, employees can learn from any Internet-connected PC, anywhere in the world. Ernst and Young reduced training costs by 35 percent while improving consistency and scalability.
- B. In addition to generally positive economic benefits, other advantages such as convenience, standardized delivery, self-paced learning, and variety of available content, have made e-learning a high priority for many corporations. E-learning is widely believed to offer flexible "any time, any place" learning. The claim for "any place" is valid in principle and is a great development. Many people can engage with rich learning materials that simply were not possible in a paper or broadcast distance-learning era. For teaching specific information and skills, e-training holds great promise. It can be especially effective at helping employees prepare for IT certification programs. E-learning also seems to effectively address topics such as sexual harassment education, safety training and management training — all areas where a clear set of objectives can be identified. Ultimately, training experts recommend a "blended" approach that combines both online and in-person training as the instruction requires. E-learning is not an end-all solution. But if it helps decrease costs and windowless classrooms filled with snoring students, it definitely has its advantages.
- C. Much of the discussion about implementing e-learning has focused on the technology, but as Driscoll and others have reminded us, e-learning is not just about the technology, but also many human factors. As any capable manager knows, teaching employees new skills is critical to a smoothly run business. Having said that, however, the traditional route of classroom instruction runs the risk of being expensive, slow and, often times, ineffective. Perhaps the classroom's greatest disadvantage is the fact that it takes employees out of their jobs. Every minute an employee is sitting in a classroom training session is a minute they're not out on the floor working. It now looks as if there is a way to circumvent these traditional training drawbacks. E-training promises more effective teaching techniques by integrating audio, video, animation, text and interactive materials with the intent of teaching each student at his or her own pace. In addition to higher performance results, there are other immediate benefits to students such as increased time on task, higher levels of motivation, and reduced test anxiety for many learners. A California State University Northridge study reported that e-learners performed 20 percent better than traditional learners. Nelson reported a significant difference between the mean grades of 406

university students earned in traditional and distance education classes, where the distance learners outperformed the traditional learners.

D. On the other hand, nobody said E-training technology would be cheap. E-training service providers, on the average, charge from \$10,000 to \$60,000 to develop one hour of online instruction. This price varies depending on the complexity of the training topic and the media used. HTML pages are a little cheaper to develop while streaming-video (presentations or flash animations) cost more. Course content is just the starting place for cost. A complete e-learning solution also includes the technology platform (the computers, applications and network connections that are used to deliver the courses). This technology platform, known as a learning management system (LMS), can either be installed onsite or outsourced. Add to that cost the necessary investments in network bandwidth to deliver multimedia courses, and you're left holding one heck of a bill. For the LMS infrastructure and a dozen or so online courses, costs can top \$500,000 in the first year. These kinds of costs mean that custom e-training is, for the time being, an option only for large organizations. For those companies that have a large enough staff, the e-training concept pays for itself. Aware of this fact, large companies are investing heavily in online training. Today, over half of the 400-plus courses that Rockwell Collins offers are delivered instantly to its clients in an e-learning format, a change that has reduced its annual (training costs by 40%. Many other success stories exist.

E. E-learning isn't expected to replace the classroom entirely. For one thing, bandwidth limitations are still an issue in presenting multimedia over the Internet. Furthermore, e-training isn't suited to every mode of instruction or topic. For instance, it's rather ineffective imparting cultural values or building teams. If your company has a unique corporate culture it would be difficult to convey that to first time employees through a computer monitor. Group training sessions are more ideal for these purposes. In addition, there is a perceived loss of research time because of the work involved in developing and teaching online classes. Professor Wallin estimated that it required between 500 and 1,000 person-hours, that is, Wallin-hours, to keep the course at the appropriate level of currency and usefulness. (Distance learning instructors often need technical skills, no matter how advanced the courseware system.) That amounts to between a quarter and half of a person-year. Finally, teaching materials require computer literacy and access to equipment. Any e-Learning system involves basic equipment and a minimum level of computer knowledge in order to perform the tasks required by the system. A student that does not possess these skills, or have access to these tools, cannot succeed in an e-Learning program.

F. While few people debate the obvious advantages of e-learning, systematic research is needed to confirm that learners are actually acquiring and using the skills that are being taught online, and that e-learning is the best way to achieve the outcomes in a corporate environment. Nowadays, a go-between style of the Blended learning, which refers to a mixing of different learning environments, is gaining popularity. It combines traditional face-to-face classroom methods with

more modern computer-mediated activities. According to its proponents, the strategy creates a more integrated approach for both instructors and learners. Formerly, technology-based materials played a supporting role to face-to-face instruction. Through a blended learning approach, technology will be more important.

Questions 1-6

The reading passage has seven paragraphs, A-F. Choose the correct heading for paragraphs A-F from the list below. Write the correct number, i-x in boxes 1-6 on your answer sheet.

List of Headings

- i. Overview of the benefits for the application of E-training
- ii. IBM's successful choice of training
- iii. Future direction and a new style of teaching
- iv. Learners achievement and advanced teaching materials
- v. Limitations when E-training compares with traditional class
- vi. Multimedia over the Internet can be a solution
- vii. Technology can be a huge financial burden
- viii. The distance learners outperformed the traditional university learners in worldwide
- ix. Other advantages besides economic consideration
- x. Training offered to help people learn using computers

1. Paragraph A
2. Paragraph B
3. Paragraph C
4. Paragraph D
5. Paragraph E
6. Paragraph F

Questions 7- 10

The reading Passage has seven paragraphs A-F. Which paragraph has the following info?

7. Projected Basic Blue in IBM achieved a great success.
8. E-learning wins as a priority for many corporations as its flexibility.
9. The combination of the traditional and e-training environments may prevail.
10. Example of a fast electronic delivery for a company's products to its customers.

Questions 11-13

Choose **THREE** correct letters, among A-E. Write your answers in boxes 11-13 on your answer sheet.

- A) Technical facilities are hardly obtained.
- B) Presenting multimedia over the Internet is restricted due to the bandwidth limit.
- C) It is ineffective imparting a unique corporate value to fresh employees.
- D) Employees need block a long time leaving their position attending training.
- E) More preparation time is needed to keep the course at the suitable level.

PASSAGE 2

SOSUS: SOUNDS OF THE OCEAN

- A. The oceans of Earth cover more than 70 percent of the planet's surface, yet, until quite recently, we knew less about their depths than we did about the surface of the Moon. Distant as it is, the Moon has been far more accessible to study because astronomers long have been able to look at its surface, first with the naked eye and then with the telescope-both instruments that focus light. And, with telescopes tuned to different wavelengths of light, modern astronomers can not only analyze Earth's atmosphere, but also determine the temperature and composition of the Sun or other stars many hundreds of light-years away. Until the twentieth century, however, no analogous instruments were available for the study of Earth's oceans: Light, which can travel trillions of miles through the vast vacuum of space, cannot penetrate very far in seawater.
- B. Curious investigators long have been fascinated by sound and the way it travels in water. As early as 1490, Leonardo da Vinci observed: "If you cause your ship to stop and place the head of a long tube in the water and place the outer extremity to your ear, you will hear ships at a great distance from you." In 1687, the first mathematical theory of sound propagation was published by Sir Isaac Newton in his *Philosophiae Naturalis Principia Mathematica*. Investigators were measuring the speed of sound in air beginning in the mid seventeenth century, but it was not until 1826 that Daniel Colladon, a Swiss physicist, and Charles Sturm, a French mathematician, accurately measured its speed in water. Using a long tube to listen underwater (as da Vinci had suggested), they recorded how fast the sound of a submerged bell traveled across Lake Geneva. Their result-1,435 meters (1,569 yards) per second in water of 1.8 degrees Celsius (35 degrees Fahrenheit)-was only 3 meters per second off from the speed accepted today. What these investigators demonstrated was that water-whether fresh or salt- is an excellent medium for sound, transmitting it almost five times faster than its speed in air.
- C. In 1877 and 1878, the British scientist John William Strutt, third Baron Rayleigh, published his two-volume seminal work, *The Theory of Sound*, often regarded as marking the beginning of the modern study of acoustics. The recipient of the Nobel Prize for Physics in 1904 for his successful isolation of the element argon, Lord Rayleigh made key discoveries in the fields of acoustics and optics that are critical to the theory of wave propagation in fluids. Among other things, Lord

Rayleigh was the first to describe a sound wave as a mathematical equation (the basis of all theoretical work on acoustics) and the first to describe how small particles in the atmosphere scatter certain wavelengths of sunlight, a principle that also applies to the behavior of sound waves in water.

- D. A number of factors influence how far sound travels underwater and how long it lasts. For one, particles in seawater can reflect, scatter, and absorb certain frequencies of sound -just as certain wavelengths of light may be reflected, scattered, and absorbed by specific types of particles in the atmosphere. Seawater absorbs 30 times the amount of sound absorbed by distilled water, with specific chemicals (such as magnesium sulfate and boric acid) damping out certain frequencies of sound. Researchers also learned that low frequency sounds, whose long wavelengths generally pass over tiny particles, tend to travel farther without loss through absorption or scattering. Further work on the effects of salinity, temperature, and pressure on the speed of sound has yielded fascinating insights into the structure of the ocean. Speaking generally, the ocean is divided into horizontal layers in which sound speed is influenced more greatly by temperature in the upper regions and by pressure in the lower depths. At the surface is a sun-warmed upper layer, the actual temperature and thickness of which varies with the season. At mid-latitudes, this layer tends to be isothermal, that is, the temperature tends to be uniform throughout the layer because the water is well mixed by the action of waves, winds, and convection currents; a sound signal moving down through this layer tends to travel at an almost constant speed. Next comes a transitional layer called the thermocline, in which temperature drops steadily with depth; as temperature falls, so does the speed of sound.
- E. The U.S. Navy was quick to appreciate the usefulness of low-frequency sound and the deep sound channel in extending the range at which it could detect submarines. In great secrecy during the 1950s, the U.S. Navy launched a project that went by the code name Jezebel; it would later come to be known as the Sound Surveillance System (SOSUS). The system involved arrays of underwater microphones, called hydrophones, that were placed on the ocean bottom and connected by cables to onshore processing centers. With SOSUS deployed in both deep and shallow waters along both coasts of North America and the British West Indies, the U.S. Navy not only could detect submarines in much of the northern hemisphere, it also could distinguish how many propellers a submarine had, whether it was conventional or nuclear, and sometimes even the class of sub.
- F. The realization that SOSUS could be used to listen to whales also was made by Christopher Clark, a biological acoustician at Cornell University, when he first visited a SOSUS station in 1992. When Clark looked at the graphic representations of sound, scrolling 24 hours day, every day, he saw the voice patterns of blue, finback, minke, and humpback whales. He also could hear the sounds. Using a SOSUS receiver in the West Indies, he could hear whales that were 1,770 kilometers (1,100 miles) away. Whales are the biggest of Earth's creatures. The blue whale, for example, can be 100

feet long and weigh as many tons. Yet these animals also are remarkably elusive. Scientists wish to observe blue time and position them on a map. Moreover, they can track not just one whale at a time, but many creatures simultaneously throughout the North Atlantic and the eastern North Pacific. They also can learn to distinguish whale calls. For example, Fox and colleagues have detected changes in the calls of finback whales during different seasons and have found that blue whales in different regions of the Pacific ocean have different calls. Whales firsthand must wait in their ships for the whales to surface. A few whales have been tracked briefly in the wild this way but not for very great distances, and much about them remains unknown. Using the SOSUS stations, scientists can track the whales in real time and position them on a map. Moreover, they can track not just one whale at a time, but many creatures simultaneously throughout the North Atlantic and the eastern North Pacific. They also can learn to distinguish whale calls. For example, Fox and colleagues have detected changes in the calls of finback whales during different seasons and have found that blue whales in different regions of the Pacific Ocean have different calls.

G. SOSUS, with its vast reach, also has proved instrumental in obtaining information crucial to our understanding of Earth's weather and climate. Specifically, the system has enabled researchers to begin making ocean temperature measurements on a global scale - measurements that are keys to puzzling out the workings of heat transfer between the ocean and the atmosphere. The ocean plays an enormous role in determining air temperature the heat capacity in only the upper few meters of ocean is thought to be equal to all of the heat in the entire atmosphere. For sound waves traveling horizontally in the ocean, speed is largely a function of temperature. Thus, the travel time of a wave of sound between two points is a sensitive indicator of the average temperature along its path. Transmitting sound in numerous directions through the deep sound channel can give scientists measurements spanning vast areas of the globe. Thousands of sound paths in the ocean could be pieced together into a map of global ocean temperatures and, by repeating measurements along the same paths over times, scientists could track changes in temperature over months or years.

H. Researchers also are using other acoustic techniques to monitor climate. Oceanographer Jeff Nystuen at the University of Washington, for example, has explored the use of sound to measure rainfall over the ocean. Monitoring changing global rainfall patterns undoubtedly will contribute to understanding major climate change as well as the weather phenomenon known as El Nino. Since 1985, Nystuen has used hydrophones to listen to rain over the ocean, acoustically measuring not only the rainfall rate but also the rainfall type, from drizzle to thunderstorms. By using the sound of rain underwater as a "natural" rain gauge, the measurement of rainfall over the oceans will become available to climatologists.

Questions 14-17

Do the following statements agree with the information given in Reading Passage 1? Write

TRUE if the statement is true

FALSE if the statement is false

NOT GIVEN if the information is not given in the passage

14 In the past, difficulties of research carried out on Moon were much easier than that of the oceans.

15 The same light technology used on investigation of moon can be employed in the field of ocean.

16 Research on the depth of ocean by method of sound wave is more time-consuming.

17 Hydrophones technology is able to detect the category of precipitation.

Questions 18-21

The reading Passage has seven paragraphs A-H. Which paragraph contains the following information? Write the correct letter A-H, in boxes 5-8 on your answer sheet. NB You may use any letter more than once.

18. Elements affect sound transmission in the ocean.

19. Relationship between global climate and ocean temperature.

20. Examples of how sound technology help people research ocean and creatures in it .

21. Sound transmission under water is similar to that of light in any condition.

Questions 22-26

Choose the correct letter, A, B, C or D. Write your answers in boxes 22-26 on your answer sheet.

22 Who of the followings is dedicated to the research of rate of sound?

- A) Leonardo da Vinci
- B) Isaac Newton
- C) John William Strutt
- D) Charles Sturm

23 Who explained that the theory of light or sound wavelength is significant in water?

- A) Lord Rayleigh
- B) John William Strutt
- C) C Charles Sturm
- D) D Christopher Clark

24. According to Fox and colleagues, in what pattern does the change of finback whale calls happen
- A) Change in various seasons
 - B) Change in various days
 - C) Change in different months
 - D) Change in different years
25. In which way does the SOSUS technology inspect whales?
- A) Track all kinds of whales in the ocean
 - B) Track bunches of whales at the same time
 - C) Track only finback whale in the ocean
 - D) Track whales by using multiple appliances or devices
26. What could scientists inspect via monitoring along a repeated route?
- A) Temperature of the surface passed
 - B) Temperature of the deepest ocean floor
 - C) Variation of temperature
 - D) Fixed data of temperature

PASSAGE 3

- A. While it may not be possible to completely age-proof our brains, a brave new world of anti-aging research shows that our gray matter may be far more flexible than we thought. So, no one, no matter how old, has to lose their mind. The brain has often been called the three-pound universe. It's our most powerful and mysterious organ, the seat of the self, laced with as many billions of neurons as the galaxy has stars. No wonder the mere notion of an aging, failing brain and the prospect of memory loss, confusion, and the unraveling of our personality is so terrifying. As Mark Williams, M.D., author of The American Geriatrics Society's Complete Guide to Aging and Health, says, "The fear of dementia is stronger than the fear of death itself." Yet the degeneration of the brain is far from inevitable. "Its design features are such that it should continue to function for a lifetime," says Zaven Khachaturian, Ph.D., director of the Alzheimer's Associations Ronald and Nancy Reagan Research Institute. "There's no reason to expect it to deteriorate with age, even though many of us are living longer lives." In fact, scientists' view of the brain's potential is rapidly changing, according to Stanford University neuroscientist Robert Sapolsky, Ph.D. "Thirty-five years ago we thought Alzheimer's disease was a dramatic version of normal aging. Now we realize it's a disease with a distinct pathology. In fact, some people simply don't experience any mental decline, so we've begun to study them." Antonio Damasio, M.D., Ph.D., head of the Department of Neurology at the University of Iowa and author of Descartes' Error, concurs. "Older people can continue to have extremely rich and healthy mental lives."

- B. The seniors were tested in 1988 and again in 1991. Four factors were found to be related to their mental fitness: levels of education and physical activity, lung function, and feelings of self-efficacy. "Each of these elements alters the way our brain functions," says Marilyn Albert, Ph.D., of Harvard Medical School, and colleagues from Yale, Duke, and Brandeis Universities and the Mt. Sinai School of Medicine, who hypothesizes that regular exercise may actually stimulate blood flow to the brain and nerve growth, both of which create more densely branched neurons, rendering the neurons stronger and better able to resist disease. Moderate aerobic exercise, including long brisk walks and frequently climbing stairs, will accomplish this.
- C. Education also seems to enhance brain function. People who have challenged themselves with at least a college education may actually stimulate the neurons in their brains. Moreover, native intelligence may protect our brains. It's possible that smart people begin life with a greater number of neurons, and therefore have a greater reserve to fall back on if some begin to fail. "If you have a lot of neurons and keep them busy, you may be able to tolerate more damage to your brain before it shows," says Peter Davies, M.D., of the Albert Einstein College of Medicine in the Bronx, New York. Early linguistic ability also seems to help our brains later in life. A recent study in the New England Journal of Medicine looked at 93 elderly nuns and examined the autobiographies they had written 60 years earlier, just as they were joining a convent. The nuns whose essays were complex and dense with ideas remained sharp into their eighties and nineties.
- D. Finally, personality seems to play an important role in protecting our mental prowess. A sense of self-efficacy may protect our brain, buffeting it from the harmful effects of stress. According to Albert, there's evidence that elevated levels of stress hormones may harm brain cells and cause the hippocampus-----a small seahorse-shaped organ that's a crucial moderator of memory-----to atrophy. A sense that we can effectively chart our own course in the world may retard the release of stress hormones and protect us as we age. "It's not a matter of whether you experience stress or not," Albert concludes, "it's your attitude toward it." Reducing stress by meditating on a regular basis may buffer the brain as well. It also increases the activity of the brain's pineal gland, the source of the antioxidant hormone melatonin, which regulates sleep and may retard the aging process. Studies at the University of Massachusetts Medical Center and the University of Western Ontario found that people who meditated regularly had higher levels of melatonin than those who took 5-milligram supplements. Another study, conducted jointly by Maharishi International University, Harvard University, and the University of Maryland, found that seniors who meditated for three months experienced dramatic improvements in their psychological well-being, compared to their non-meditative peers.
- E. Animal studies confirm that both mental and physical activity boost brain fitness. At the Beckman Institute for Advanced Science and Technology in Urbana, Illinois, psychologist William Greenough, Ph. D., let some rats play with a profusion of toys. These rodents developed about 25 percent more connections between their neurons than did rats that didn't get any mentally

stimulating recreation. In addition, rats that exercised on a treadmill developed more capillaries in specific parts of their brains than did their sedentary counterparts. This increased the blood flow to their brains. "Clearly the message is to do as many different flyings as possible," Greenough says.

F. It's not just scientists who are catching anti-aging fever. Walk into any health food store, and you'll find nutritional formulas with names like Brainstorm and Smart ALEC—that claim to sharpen mental ability. The book *Smart Drugs & Nutrients*, by Ward Dean, M.D., and John Morgenthaler, was self-published in 1990 and has sold over 120,000 copies worldwide. It has also spawned an underground network of people tweaking their own brain chemistry with nutrients and drugs the latter sometimes obtained from Europe and Mexico. Sales of ginkgo - an extract from the leaves of the 200-million-year-old ginkgo tree, which has been shown in published studies to increase oxygen in the brain and ameliorate symptoms of Alzheimer's disease are up by 22 percent in the last six months alone, according to Paddy Spence, president of SPINS, a San Francisco-based market research firm. Indeed, products that increase and preserve mental performance are a small but emerging segment of the supplements industry, says Linda Gilbert, president of Health Focus, a company that researches consumer health trends. While neuroscientists like Khachaturian liken the use of these products to the superstition of tossing salt over your shoulder, the public is nevertheless gobbling up nutrients that promise cognitive enhancement.

Questions 27-30

Choose the Four correct letters among A-G. Write your answers in boxes 27-30 on your answer sheet. Which of the **FOUR** situations or conditions assisting the Brains' function?

- A. Preventive treatment against Alzheimer's disease
- B. Doing active aerobic exercise and frequently climbing stairs
- C. High levels of education
- D. Early verbal or language competence training
- E. Having more supplements such as ginkgo tree
- F. Participate in more physical activity involving in stimulating tasks
- G. Personality and feelings of self-fulfillment

Questions 31-38

Use the information in the passage to match the people (listed A-G) with opinions or deeds below. Write the appropriate letters A-G in boxes 32-39 on your answer sheet. **NB** you may use any letter more than once

- A. Zaven Khachaturian
- B. William Greenough
- C. Marilyn Albert
- D. Robert Sapolsky
- E. Linda Gilbert
- F. Peter Davies
- G. Paddy Spence

- 31. Alzheimer's was probably a kind of disease rather than a normal aging process.
- 32. Keeping neurons busy, people may be able to endure more harm to your brain
- 33. Regular exercises boost blood flow to the brain and increase anti-disease disability.
- 34. Significant increase of Sales of ginkgo has been shown.
- 35. More links between their neurons are found among stimulated animals.
- 36. Effectiveness of the use of brains supplements products can be of little scientific proof.
- 37. Heightened levels of stress may damage brain cells and cause part of brain to deteriorate.
- 38. Products that upgrade and preserve mental competence are still a newly developing industry.

Questions 39

Choose the correct letter from A-D. Write your answer in box 39 on your answer sheet.

According the passage, what is the most appropriate title for this passage?

- A) Making our minds last a lifetime
- B) Amazing pills of the ginkgo
- C) How to stay healthy in your old hood
- D) More able a brain and neurons

READING 33
PASSAGE 1

FLOODING AND ITS IMPACT

Floods can occur in rivers when the flow rate exceeds the capacity of the river channel, particularly at bends or meanders in the waterway. Floods often cause damage to homes and businesses if they are in the natural flood plains of rivers. While riverine flood damage can be eliminated by moving away from rivers and other bodies of water, people have traditionally lived and worked by rivers because the land is usually flat and fertile and because rivers provide easy travel and access to commerce and industry.

- A. FIRE and FLOOD are two of humanity's worst nightmares. People have, therefore, always sought to control them. Forest fires are snuffed out quickly. The flow of rivers is regulated by weirs and dams. At least, that is how it used to be. But foresters have learned that forests need fires to clear out the brush and even to get seeds to germinate. And a similar revelation is now dawning on hydrologists. Rivers - and the ecosystems they support - need floods. That is why a man-made torrent has been surging down the Grand Canyon. By Thursday March 6th it was running at full throttle, which was expected to be sustained for 60 hours.
- B. Floods once raged through the canyon every year. Spring Snow from as far away as Wyoming would melt and swell the Colorado River to a flow that averaged around 1,500 cubic metres (50,000 cubic feet) a second. Every eight years or so, that figure rose to almost 3,000 cubic metres. These floods infused the river with sediment, carved its beaches and built its sandbars.
- C. However, in the four decades since the building of the Glen Canyon dam, just upstream of the Grand Canyon, the only sediment that it has collected has come from tiny, undammed tributaries. Even that has not been much use as those tributaries are not powerful enough to distribute the sediment in an ecologically valuable way.
- D. This lack of flooding has harmed local wildlife. The humpback chub, for example, thrived in the rust-red waters of the Colorado. Recently, though, its population has crashed. At first sight, it looked as if the reason was that the chub were being eaten by trout introduced for sport fishing in the mid-20th century. But trout and chub co-existed until the Glen Canyon dam was built, so something else is going on. Steve Gloss, of the United States' Geological Survey (USGS), reckons that the chub's decline is the result of their losing their most valuable natural defense, the Colorado's rusty sediment. The chub were well adapted to the poor visibility created by the thick, red water which gave the river its name, and depended on it to hide from predators. Without the cloudy water the chub became vulnerable.
- E. And the chub are not alone. In the years since the Glen Canyon dam was built, several species have vanished altogether. These include the Colorado pike-minnow, the razorback sucker and the roundtail chub. Meanwhile, aliens including fathead minnows, channel catfish and common carp, which would have been hard, put to survive in the savage waters of the undammed canyon, have moved in.

- F. So flooding is the obvious answer. Unfortunately, it is easier said than done. Floods were sent down the Grand Canyon in 1996 and 2004 and the results were mixed. In 1996 the flood was allowed to go on too long. To start with, all seemed well. The floodwaters built up sandbanks and infused the river with sediment. Eventually, however, the continued flow washed most of the sediment out of the canyon. This problem was avoided in 2004, but unfortunately, on that occasion, the volume of sand available behind the dam was too low to rebuild the sandbanks. This time, the USGS is convinced that things will be better. The amount of sediment available is three times greater than it was in 2004. So if a flood is going to do some good, this is the time to unleash one.
- G. Even so, it may turn out to be an empty gesture. At less than 1,200 cubic metres a second, this flood is smaller than even an average spring flood, let alone one of the mightier deluges of the past. Those glorious inundations moved massive quantities of sediment through the Grand Canyon, wiping the slate dirty, and making a muddy mess of silt and muck that would make modern river rafters cringe.

Questions 1-7

Do the following statements agree with the information given in Reading Passage 1?

TRUE if the statement is true

FALSE if the statement is false

NOT GIVEN if the information is not given in the passage

1. Damage caused by fire is worse than that caused by flood.
2. The flood peaks at almost 1500 cubic meters every eight years.
3. Contribution of sediments delivered by tributaries has little impact.
4. Decreasing number of chubs is always caused by introducing of trout since mid-20th century.
5. It seemed that the artificial flood in 1996 had achieved success partly at the very beginning.
6. In fact, the yield of artificial flood water is smaller than an average natural flood at present.
7. Mighty floods drove fast moving flows with clean and high quality water.

Questions 8-13

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 8-13 on your answer sheet.

The Eco- Impact of the Canyon Dam

Floods are people's nightmare. In the past, canyon was raged by flood every year. The snow from far Wyoming would melt in the season of 8..... and caused a flood flow peak in Colorado River. In the four decades after people built the Glen Canyon dam, it only could gather 9..... together from tiny, undammed tributaries.

Humpback chub population reduced, why?

Then, several species disappeared including Colorado pike-minnow, 10..... and the round-tail chub. Meanwhile, some moved in such as fathead minnows, channel catfish and 11..... The non-stopped flow led to the washing away of the sediment out of the canyon, which poses great threat to the chubs because this sediment caused poor 12..... which kept the chubs away from predators. In addition, the volume of 13..... available behind the dam was too low to rebuild the bars and flooding became more serious.

PASSAGE 2

SMELL AND NOSTALGIA

Why does the scent of a fragrance or the mustiness of an old trunk trigger such powerful memories of childhood? New research has the answer, writes Alexandra Witze.

- A. You probably pay more attention to a newspaper with your eyes than with your nose. But lift the paper to your nostrils and inhale. The smell of newsprint might carry you back to your childhood, when your parents perused the paper on Sunday mornings. Or maybe some other smell takes you back - the scent of your mother's perfume, the pungency of a driftwood campfire. Specific odours can spark a flood of reminiscences. Psychologists call it the "Proustian phenomenon", after French novelist Marcel Proust. Near the beginning of the masterpiece, *In Search of Lost Time*, Proust's narrator dunks a madeleine cookie into a cup of tea - and the scent and taste unleash a torrent of childhood memories for 3000 pages.
- B. Now, this phenomenon is getting the scientific treatment. Neuroscientists Rachel Herz, a cognitive neuroscientist at Brown University in Providence, Rhode Island, have discovered, for instance, how sensory memories are shared across the brain, with different brain regions remembering the sights, smells, tastes and sounds of a particular experience. Meanwhile, psychologists have demonstrated that memories triggered by smells can be more emotional, as well as more detailed, than memories not related to smells. When you inhale, odour molecules set brain cells dancing within a region known as the amygdala, a part of the brain that helps control emotion. In contrast, the other senses, such as taste or touch, get routed through other parts of the brain before reaching the amygdala. The direct link between odours and the amygdala may help explain the emotional potency of smells. "There is this unique connection between the sense of smell and the part of the brain that processes emotion," says Rachel Herz.
- C. But the links don't stop there. Like an octopus reaching its tentacles outward, the memory of smells affects other brain regions as well. In recent experiments, neuroscientists at University College London (UCL) asked 15 volunteers to look at pictures while smelling unrelated odours. For instance, the subjects might see a photo of a duck paired with the scent of a rose, and then be asked to create a story linking the two. Brain scans taken at the time revealed that the volunteers' brains were particularly active in a region known as the olfactory cortex, which is known to be involved in processing smells. Five minutes later, the volunteers were shown the duck photo again, but without the rose smell. And in their brains, the olfactory cortex lit up again, the scientists reported recently. The fact that the olfactory cortex became active in the absence of the odour suggests that people's sensory memory of events is spread across different brain regions. Imagine going on a seaside holiday, says UCL team leader, Jay Gottfried. The sight of the waves becomes stored in one area, whereas the crash of the surf goes elsewhere, and the smell of seaweed in yet another place. There could be advantages to having memories spread around the brain. "You can reawaken that memory from any one of the sensory triggers," says Gottfried. "Maybe the smell of the sun lotion, or a particular sound from that day, or the sight of a rock formation." Or - in the case of an early hunter and gatherer (out on a plain - the sight of a lion might trigger the urge to flee, rather than having to wait for the sound of its roar and the stench of its hide to kick in as well.

- D. Remembered smells may also carry extra emotional baggage, says Herz. Her research suggests that memories triggered by odours are more emotional than memories triggered by other cues. In one recent study, Herz recruited five volunteers who had vivid memories associated with a particular perfume, such as opium for Women and Juniper Breeze from Bath and Body Works. She took images of the volunteers' brains as they sniffed that perfume and an unrelated perfume without knowing which was which. (They were also shown photos of each perfume bottle.) Smelling the specified perfume activated the volunteers' brains the most, particularly in the amygdala, and in a region called the hippocampus, which helps in memory formation. Herz published the work earlier this year in the journal *Neuropsychologia*.
- E. But she couldn't be sure that the other senses wouldn't also elicit a strong response. So in another study Herz compared smells with sounds and pictures. She had 70 people describe an emotional memory involving three items - popcorn, fresh-cut grass and a campfire. Then they compared the items through sights, sounds and smells. For instance, the person might see a picture of a lawnmower, then sniff the scent of grass and finally listen to the lawnmower's sound. Memories triggered by smell were more evocative than memories triggered by either sights or sounds.
- F. Odour-evoked memories may be not only more emotional, but more detailed as well. Working with colleague John Downes, psychologist Simon Chu of the University of Liverpool started researching odour and memory partly because of his grandmother's stories about Chinese culture. As generations gathered to share oral histories, they would pass a small pot of spice or incense around; later, when they wanted to remember the story in as much detail as possible, they would pass the same smell around again. "It's kind of fits with a lot of anecdotal evidence on how smells can be really good reminders of past experiences," Chu says. And scientific research seems to bear out the anecdotes. In one experiment, Chu and Downes asked 42 volunteers to tell a life story, then tested to see whether odours such as coffee and cinnamon could help them remember more detail in the story. They could.
- G. Despite such studies, not everyone is convinced that Proust can be scientifically analysed. In the June issue of *Chemical Senses*, Chu and Downes exchanged critiques with renowned perfumer and chemist J. Stephan Jellinek. Jellinek chided the Liverpool researchers for, among other things, presenting the smells and asking the volunteers to think of memories, rather than seeing what memories were spontaneously evoked by the odours. But there's only so much science can do to test a phenomenon that's inherently different for each person, Chu says. Meanwhile, Jellinek has also been collecting anecdotal accounts of Proustian experiences, hoping to find some common links between the experiences. "I think there is a case to be made that surprise may be a major aspect of the Proust phenomenon," he says. "That's why people are so struck by these memories." No one knows whether Proust ever experienced such a transcendental moment. But his notions of memory, written as fiction nearly a century ago, continue to inspire scientists of today.

Questions 14-18

Use the information in the passage to match the people (listed A-C) with opinions or deeds below. Write the appropriate letters A-C in boxes 14-18 on your answer sheet. NB you may use any letter more than once

- A Rachel Herz
B Simon Chu

C Jay Gottfried

14. Found pattern of different sensory memories stored in various zones of a brain.
15. Smell brings detailed event under a smell of certain substance.
16. Connection of smell and certain zones of brain is different with that of other senses.
17. Diverse locations of stored information help us keep away the hazard.
18. There is no necessary correlation between smell and processing zone of brain.

Questions 19-22

Choose the correct letter, A, B, C or D. Write your answers in boxes 19-22 on your answer sheet.

19. What does the experiment conducted by Herz show?
A. Women are more easily addicted to opium medicine
B. Smell is superior to other senses in connection to the brain
C. Smell is more important than other senses
D. Amygdala is part of brain that stores and processes memory
20. What does the second experiment conducted by Herz suggest?
A. Result directly conflicts with the first one
B. Result of her first experiment is correct
C. Sights and sounds trigger memories at an equal level
D. Lawnmower is a perfect example in the experiment
21. What is the outcome of experiment conducted by Chu and Downes?
A. Smell is the only functional under Chinese tradition
B. Half of volunteers told detailed stories
C. Smells of certain odours assist story tellers
D. Odours of cinnamon is stronger than that of coffee
22. What is the comment of Jellinek to Chu and Downes in the issue of *Chemical Senses*?
A. Jellinek accused their experiment of being unscientific
B. Jellinek thought Liverpool is not a suitable place for experiment
C. Jellinek suggested that there was no further clue of what specific memories aroused
D. Jellinek stated that experiment could be remedied

Questions 23-26

Summary

Complete the following summary of the paragraphs of Reading Passage, using **NO MORE THAN THREE** words from the Reading Passage for each answer. Write your answers in boxes 23-26 on your answer sheet.

In the experiments conducted by UCL, participants were asked to look at a picture with a scent of a flower, then in the next stage, everyone would have to 23 _____ for a connection. A method called 24 _____ suggested that specific area of brain named 25 _____ were quite active. Then in another paralleled experiment about Chinese elders, storytellers could recall detailed anecdotes when smelling bowl of 26 _____ or incense around.

SECTION 3

STALIN'S NEW WORKING WEEK

Historian investigates how Stalin changed the calendar to keep the Soviet people continually at work.

- A. "There are no fortresses that Bolsheviks cannot storm". With these words, Stalin expressed the dynamic self-confidence of the Soviet Union's Five Year Plan: weak and backward Russia was to turn overnight into a powerful modern industrial country. Between 1928 and 1932, production of coal, iron and steel increased at a fantastic rate, and new industrial cities sprang up, along with the world's biggest dam. Everyone's life was affected, as collectivised farming drove millions from the land to swell the industrial proletariat. Private enterprise disappeared in city and country, leaving the State supreme under the dictatorship of Stalin. Unlimited enthusiasm was the mood of the day, with the Communists believing that iron will and hard-working manpower alone would bring about a new world.
- B. Enthusiasm spread to time itself, in the desire to make the state a huge efficient machine, where not a moment would be wasted, especially in the workplace. Lenin had already been intrigued by the ideas of the American Frederick Winslow Taylor (1856-1915), whose time-motion studies had discovered ways of stream-lining effort so that every worker could produce the maximum. The Bolsheviks were also great admirers of Henry Ford's assembly line mass production and of his Fordson tractors that were imported by the thousands. The engineers who came with them to train their users helped spread what became a real cult of Ford. Emulating and surpassing such capitalist models formed part of the training of the new Soviet Man, a heroic figure whose unlimited capacity for work would benefit everyone in the dynamic new society. All this culminated in the Plan, which has been characterized as the triumph of the machine, where workers would become supremely efficient robot-like creatures.
- C. Yet this was Communism whose goals had always included improving the lives of the proletariat. One major step in that direction was the sudden announcement in 1927 that reduced the working day from eight to seven hours. In January 1929, all industries were ordered to adopt the shorter day by the end of the Plan. Workers were also to have an extra hour off on the eve of Sundays and holidays. Typically though, the state took away more than it gave, for this was part of a scheme to increase production by establishing a three-shift system. This meant that the factories were open day and night and that many had to work at highly undesirable hours.
- D. Hardly had that policy been announced, though, than Yuri Larin, who had been a close associate of Lenin and architect of his radical economic policy, came up with an idea for even greater efficiency. Workers were free and plants were closed on Sundays. Why not abolish that wasted day by instituting a continuous workweek so that the machines could operate to their full capacity every day of the week? When Larin presented his idea to the Congress of Soviets in May 1929, no one paid much attention. Soon after, though, he got the ear of Stalin, who approved. Suddenly, in June, the Soviet press was filled with articles praising the new scheme. In August, the Council of Peoples' Commissars ordered that the continuous workweek be brought into immediate effect, during the height of enthusiasm for the Plan, whose goals the new schedule seemed guaranteed to forward.

- E. The idea seemed simple enough, but turned out to be very complicated in practice. Obviously, the workers couldn't be made to work seven days a week, nor should their total work hours be increased. The solution was ingenious: a new five-day week would have the workers on the job for four days, with the fifth day free; holidays would be reduced from ten to five, and the extra hour off on the eve of rest days would be abolished. Staggering the rest-days between groups of workers meant that each worker would spend the same number of hours on the job, but the factories would be working a full 360 days a year instead of 300. The 360 divided neatly into 72 five-day weeks. Workers in each establishment (at first factories, then stores and offices) were divided into five groups, each assigned a colour which appeared on the new Uninterrupted Work Week calendars distributed all over the country. Colour-coding was a valuable mnemonic device, since workers might have trouble remembering what their day off was going to be, for it would change every week. A glance at the colour on the calendar would reveal the free day, and allow workers to plan their activities. This system, however, did not apply to construction or seasonal occupations, which followed a six-day week, or to factories or mines which had to close regularly for maintenance: they also had a six-day week, whether interrupted (with the same day off for everyone) or continuous. In all cases, though, Sunday was treated like any other day.
- F. Official propaganda touted the material and cultural benefits of the new scheme. Workers would get more rest; production and employment would increase (for more workers would be needed to keep the factories running continuously); the standard of living would improve. Leisure time would be more rationally employed, for cultural activities (theatre, clubs, sports) would no longer have to be crammed into a weekend, but could flourish every day, with their facilities far less crowded. Shopping would be easier for the same reasons. Ignorance and superstition, as represented by organized religion, would suffer a mortal blow, since 80 per cent of the workers would be on the job on any given Sunday. The only objection concerned the family, where normally more than one member was working: well the Soviets insisted, the narrow family was far less important than the vast common good and besides, arrangements could be made for husband and wife to share a common schedule. In fact, the regime had long wanted to weaken or sideline the two greatest potential threats to its total dominance: organised religion and the nuclear family. Religion succumbed, but the family, as even Stalin finally had to admit, proved much more resistant.
- G. The continuous work week, hailed as a Utopia where time itself was conquered and the sluggish Sunday abolished forever, spread like an epidemic. According to official figures, 63 per cent of industrial workers were so employed by April 1930; in June, all industry was ordered to convert during the next year. The fad reached its peak in October when it affected 73 per cent of workers. In fact, many managers simply claimed that their factories had gone over to the new week, without actually applying it. Conforming to the demands of the Plan was important; practical matters could wait. By then, though, problems were becoming obvious. Most serious (though never officially admitted), the workers hated it. Coordination of family schedules was virtually impossible and usually ignored, so husbands and wives only saw each other before or after work; rest days were empty without any loved ones to share them - even friends were likely to be on a different schedule. Confusion reigned: the new plan was introduced haphazardly, with some factories operating five-, six- and seven-day weeks at the same time, and the workers often not getting their rest days at all.

- H. The Soviet government might have ignored all that (it didn't depend on public approval), but the new week was far from having the vaunted effect on production. With the complicated rotation system, the work teams necessarily found themselves doing different kinds of work in successive weeks. Machines, no longer consistently in the hands of people who knew how to tend them, were often poorly maintained or even broken. Workers lost a sense of responsibility for the special tasks they had normally performed.
- I. As a result, the new week started to lose ground. Stalin's speech of June 1931, which criticised the "depersonalised labour" its too hasty application had brought, marked the beginning of the end. In November, the government ordered the widespread adoption of the six-day week, which had its own calendar, with regular breaks on the 6th, 12th, 18th, 24th, and 30th, with Sunday usually as a working day. By July 1935, only 26 per cent of workers still followed the continuous schedule, and the six-day week was soon on its way out. Finally, in 1940, as part of the general reversion to more traditional methods, both the continuous five-day week and the novel six-day week were abandoned, and Sunday returned as the universal day of rest. A bold but typically ill-conceived experiment was at an end.

Questions 27-34

Reading Passage 2 has nine paragraphs A-I. Choose the correct heading for each paragraph from the list of headings below. Write the correct number i-xii in boxes 27-34 on your answer sheet.

List of Headings	
i.	Benefits of the new scheme and its resistance
ii.	Making use of the once wasted weekends
iii.	Cutting work hours for better efficiency
iv.	Optimism of the great future
v.	Negative effects on production itself
vi.	Soviet Union's five year plan
vii.	The abolishment of the new work-week scheme
viii.	The Ford model
ix.	Reaction from factory workers and their families
x.	The color-coding scheme
xi.	Establishing a three-shift system
xii.	Foreign inspiration

27. Paragraph A
28. Paragraph B
29. Paragraph D
30. Paragraph E
31. Paragraph F
32. Paragraph G
33. Paragraph H
34. Paragraph I

Example

Answer

Paragraph C

iii

Questions 35-37

Choose the correct letter A, B, C or D. Write your answers in boxes 35-37 on your answer sheet.

35. According to paragraph A, Soviet's five-year plan was a success because
- A) Bolsheviks built a strong fortress.
 - B) Russia was weak and backward.
 - C) industrial production increased.
 - D) Stalin was confident about Soviet's potential.
36. Daily working hours were cut from eight to seven to
- A) improve the lives of all people.
 - B) boost industrial productivity.
 - C) get rid of undesirable work hours.
 - D) change the already established three-shift work system.
37. Many factory managers claimed to have complied with the demands of the new work week because
- A) they were pressurized by the state to do so.
 - B) they believed there would not be any practical problems.
 - C) they were able to apply it.
 - D) workers hated the new plan.

Questions 38-40

Answer the questions below using **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 38-40 on your answer sheet.

38. Whose idea of continuous work week did Stalin approve and helped to implement?
39. What method was used to help workers to remember the rotation of their off days?
40. What was the most resistant force to the new work week scheme?

READING 34

READING PASSAGE 1

THE ITALIAN ARCHITECT - ANDREA PALLADIO

A new exhibition celebrates Palladio's architecture 500 years on

- A. Vicenza is a pleasant, prosperous city in the Veneto, 60 km west of Venice. Its grand families settled and farmed the area from the 16th century. But its principal claim to fame is Andrea Palladio, who is such an influential architect that a neoclassical style is known as Palladian. The city is permanent exhibition of some of his finest buildings, and as he was born – in Padua, to be precise – 500 years ago, the International Centre for the Study of Palladio's Architecture has an excellent excuse for mounting *la grande mostra*, the big show.
- B. The exhibition has the special advantage of being held in one of Palladio's buildings, Palazzo Barbaran da Porto. Its bold façade is a mixture of rustication and decoration set between two rows of elegant columns. On the second floor the pediments are alternately curved or pointed, a Palladian trademark. The harmonious proportions of the atrium at the entrance lead through to a dramatic interior of fine fireplaces and painted ceilings. Palladio's design is simple, clear and not over-crowded. The show has been organized on the same principles, according to Howard Burns, the architectural historian who co-curated it.
- C. Palladio's father was a miller who settled in Vicenza, where the young Andrea was apprenticed to a skilled stonemason. How did a humble miller's son become a world-renowned architect? The answer in the exhibition is that, as a young man, Palladio excelled at carving decorative stonework on columns, doorways and fireplaces. He was plainly intelligent, and lucky enough to come across a rich patron, Gian Giorgio Trissino, a landowner and scholar, who organized his education, taking him to Rome in the 1540s, where he studied the masterpieces of classical Roman and Greek architecture and the work of other influential architects of the time, such as Donato Bramante and Raphael.
- D. Burns argues that social mobility was also important. Entrepreneurs, prosperous from agriculture in the Veneto, commissioned the promising local architect to design their country villas and their urban mansions. In Venice the aristocracy were anxious to co-opt talented artists, and Palladio was given the chance to design the buildings that have made him famous – the churches of San Giorgio Maggiore and the Redentore, both easy to admire because they can be seen from the city's historical centre across a stretch of water.
- E. He tried his hand at bridges – his unbuilt version of Rialto Bridge was decorated with the large pediment and columns of a temple – and, after a fire at the Ducal Palace, he offered an alternative design which bears an uncanny resemblance to the Banqueting House in Whitehall in London. Since it was designed by Inigo Jones, Palladio's first foreign disciple, this is not as surprising as it sounds.
- F. Jones, who visited Italy in 1614, bought a trunk full of the master's architectural drawings; they passed through the hands of the Dukes of Burlington and Devonshire before settling at the Royal Institute of British architects in 1894. Many are now on display at Palazzo Barbaran. What they show is how Palladio drew on the buildings of ancient Rome as models. The major theme of both

his rural and urban building was temple architecture, with a strong pointed pediment supported by columns and approached by wide steps.

6. Palladio's work for rich landowners alienates unreconstructed critics on the Italian left, but among the paper in the show are designs for cheap housing in Venice. In the wider world, Palladio's reputation has been nurtured by a text he wrote and illustrated, "Quattro Libri dell'Architettura." His influence spread to St. Petersburg and to Charlottesville in Virginia, where Thomas Jefferson commissioned a Palladian villa he called Monticello.
- H. Vicenza's show contains detailed models of major buildings and is leavened by portraits of Palladio's teachers and clients by Titian, Veronese and Tintoretto; the paintings of his Venetian buildings are all by Canaletto, no less. This is an uncompromising exhibition; many of the drawings are small and faint, and there are no sideshows for children, but the impact of harmonious lines and satisfying proportions is to impart in a viewer a feeling of benevolent calm. Palladio is history's most therapeutic architect.
- I. "Palladio, 500 Anni: La Grande Mostra" is at Palazzo Barbaran da Porto, Vicenza, until January 6th 2009. The exhibition continues at the Royal Academy of Arts, London, from January 31st to April 13th, and travels afterwards to Barcelona and Madrid.

Questions 1-7

Do the following statements agree with the information given in the reading Passage 1? In boxes 1-7 on your answer sheet, write

- TRUE if the statement agrees with the information
FALSE if the statement contradicts the information
NOT GIVEN if there is no information on this

1. The building where the exhibition is staged has been newly renovated.
2. Palazzo Barbaran da Porto typically represents the Palladio's design.
3. Palladio's father worked as an architect.
4. Palladio's family refused to pay for his architectural studies.
5. Palladio's alternative design for the Ducal Palace in Venice was based on an English building.
6. Palladio designed for both wealthy and poor people.
7. The exhibition includes paintings for people by famous artists.

Questions 8-13

Complete the sentences below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 8-13 on your answer sheet.

8. What job was Palladio training for before he became an architect?
9. Who arranged Palladio's architectural studies?
10. Who was the first non-Italian architect influenced by Palladio?
11. What type of Ancient Roman buildings most heavily influenced Palladio's work?
12. What did Palladio write that strengthened his reputation?
13. In the writer's opinion, what feeling will visitors to the exhibition experience?

READING PASSAGE 2

Questions 14-20

Reading Passage 2 has seven paragraphs, A-G. Choose the correct heading for each paragraph from the list of headings below. Write the correct number, i-viii, in boxes 14-20 on your answer sheet.

List of Headings

- i. How CSR may help one business expand
- ii. CSR in many aspects of a company's business
- iii. A CSR initiative without a financial gain
- iv. Lack of action by the state of social issues
- v. Drives of pressure motivate companies to address CSR
- vi. The past illustrates business are responsible for future outcomes
- vii. Companies applying CSR should be selective
- viii. Reasons that business and society benefit each other

14. Paragraph A

15. Paragraph B

16. Paragraph C

17. Paragraph D

18. Paragraph E

19. Paragraph F

20. Paragraph G

THE SOCIAL RESPONSIBILITY OF THE CORPORATE SECTOR

Broadly speaking, proponents of CSR have used four arguments to make their case: moral obligation, sustainability, license to operate, and reputation. The moral appeal – arguing that companies have a duty to be good citizens and to “do the right thing” – is prominent in the goal of Business for Social Responsibility, the leading non-profit CSR business association in the United States. It asks that its members “achieve commercial success in ways that honour ethical values and respect people, communities, and the natural environment. “Sustainability emphasizes environmental and community stewardship.”

- A. An excellent definition was developed in the 1980s by Norwegian Prime Minister Gro Harlem Brundtland and used by the World Business Council for Sustainable Development: “Meeting the needs of the present without compromising the ability of future generations to meet their own needs.” Nowadays, governments and companies need to account for the social consequences of their actions. As a result, corporate social responsibility (CSR) has become a priority for business leaders around the world. When a well-run business applies its vast resources and expertise to social problems that it understands and in which it has a stake, it can have a greater impact than any other organization. The notion of license to operate derives from the fact that every company needs tacit or explicit permission from governments, communities, and numerous other stakeholders to justify CSR initiatives to improve a company's image, strengthen its brand, enliven morale and even raise the value of its stock.
- B. To advance CSR, we must root it in a broad understanding of the interrelationship between a corporation and society. Successful corporations need a healthy society. Education, health care,

and equal opportunity are essential to a productive workforce. Safe products and working conditions not only attract customers but lower internal costs of accidents. Efficient utilization of land, water, energy, and other natural resources makes business more productive. Good government, the rule of law, and property rights are essential for efficiency and innovation. Strong regulatory standards protect both consumers and competitive companies from exploitation. Ultimately, a healthy society creates expanding demand for business as more human needs are met and aspirations grow. Any business that pursues its ends at the expense of the society in which it operates will find its success to be illusory and ultimately temporary. At the same time, a healthy society needs successful companies. No social program can rival the business sector when it comes to creating the jobs, wealth, and innovation that improve standards of living and social conditions over time.

- C. A company's impact on society also changes over time, as social standards evolve and science progresses. Asbestos, now understood as a serious health risk, was thought to be safe in the early 1900s, given the scientific knowledge then available. Evidence of its risks gradually mounted for more than 50 years before any company was held liable for the harms it can cause. Many firms that failed to anticipate the consequences of this evolving body of research have been bankrupted by the results. No longer can companies be content to monitor only the obvious social impacts of today. Without a careful process for identifying evolving social effects of tomorrow, firms may risk their very survival.
- D. No business can solve all of society's problems or bear the cost of doing so. Instead, each company must select issues that intersect with its particular business. Other social agendas are best left to those companies in other industries, NGOs, or government institutions that are better positioned to address them. The essential test that should guide CSR is not whether a cause is worthy but whether it presents an opportunity to create shared value – that is, a meaningful benefit for society that is also valuable to the business. Each company can identify the particular set of problems that it is best equipped to help resolve and from which it can gain the greatest competitive benefit.
- E. The best corporate citizenship initiatives involve far more than writing a check: They specify clear, measurable goals and track results over time. A good example is General Electronics' program to adopt underperforming public high schools near several of its major US facilities. The company contributes between \$250,000 and \$1 million over a five-year period to each school and makes in-kind donations as well. GE managers and employees take an active role by working with school administrators to assess needs and mentor or tutor students. In an independent study of ten schools in the program between 1989 and 1999, nearly all showed significant improvement, while the graduation rate in four of the five worst performing schools doubled from an average of 30% to 60%. Effective corporate citizenship initiatives such as this one create goodwill and improve relations with local governments and other important constituencies. What's more, GE's employees feel great pride in their participation. Their effect is inherently limited, however. No matter how beneficial the program is, it remains incidental to the company's business, and the direct effect on GE's recruiting and retention is modest.
- F. Microsoft's Working Connections partnership with the American Association of Community Colleges (AACC) is a good example of a shared-value opportunity arising from investments in context. The shortage of information technology workers is a significant constraint on Microsoft's

growth; currently, there are more than 450,000 unified IT positions in the United States alone. Community colleges, with an enrollment of 11.6 million students, representing 45% of all U.S. undergraduates, could be a major solution. Microsoft recognizes, however, that community colleges face special challenges: IT curricula are not standardized, technology used in classrooms is often outdated, and there are no systematic professional development programs to keep faculty up to date. Microsoft's \$50 million five-year initiative was aimed at all three problems. In addition to contributing money and products, Microsoft sent employee volunteers to colleges to assess needs, contribute to curriculum development, and create faculty development institutes. Microsoft has achieved results that have benefitted many communities while having a direct-and potentially significant-impact on the company.

- G. At the heart of any strategy is a unique value proposition: a set of needs a company can meet for its chosen customers that others cannot. The most strategic CSR occurs when a company adds a social dimension to its value proposition, making social impact integral to the overall strategy. Consider Whole Foods Market, whose value proposition is to sell organic, natural, and healthy food products to customers who are passionate about food and the environment. The company's sourcing emphasizes purchases from local farmers through each store's procurement process. Buyers screen out foods containing any of nearly 100 common ingredients that the company considers unhealthy or environmentally damaging. The same standards apply to products made internally. Whole Foods' commitment to natural and environmentally friendly operating practices extends well beyond sourcing. Stores are constructed using a minimum of virgin raw materials. Recently, the company purchased renewable wind energy credits equal to 100% of its electricity use in all of its stores and facilities, the only Fortune 500 company to offset its electricity consumption entirely. Spoiled produce and biodegradable waste are trucked to regional centers for composting. Whole Foods' vehicles are being converted to run on biofuels. Even the cleaning products used in its stores are environmentally friendly. And through its philanthropy, the company has created the Animal Compassion Foundation to develop more natural humane ways of raising farm animals. In short, nearly every aspect of the company's value chain reinforces the social dimensions of its value proposition, distinguishing Whole Foods from its competitors.

Questions 21 – 22

Complete the summary below. Chose **NO MORE THAN TWO WORDS** from the passage from each answer. Write your answers in boxes 21-22 on your answer sheet.

The implement of CSR, HOW?

Promotion of CSR requires the understanding of interdependence between business and society. Corporation workers' productivity generally needs health care, education, and given 21_____. Restrictions imposed by government and companies both protect consumers from being treated unfairly. Improvement of the safety standard can reduce the 22_____ of accidents in the workplace. Similarly, society, becomes a pool of more human needs and aspirations.

Questions 23 – 26

Look at the following opinions or deeds (Questions 23 – 26) and the list of companies below.
Match each opinion or deed with the correct company A, B or C. Write the correct letter A, B or C in boxes 23 – 26 on your answer sheet. **NB** You may use any letter more than once.

- 23. The disposable waste
- 24. The way company purchases its goods
- 25. Helping the undeveloped
- 26. Ensuring the people have the latest information

List of Companies

- | | |
|----------|---------------------|
| A | General Electronics |
| B | Microsoft |
| C | Whole Foods Market |

PASSAGE 3

THE SIGNIFICANT ROLE OF MOTHER TONGUE IN EDUCATION

One consequence of population mobility is an increasing diversity within schools. To illustrate, in the city of Toronto in Canada, 58% of kindergarten pupils come from homes where English is not the usual language of communication. Schools in Europe and North America have experienced this diversity for years, and educational policies and practices vary widely between countries and even within countries. Some political parties and groups search for ways to solve the problem of diverse communities and their integration in schools and society. However, they see few positive consequences for the host society and worry that this diversity threatens the identity of the host society. Consequently, they promote unfortunate educational policies that will make the "problem" disappear. If students retain their culture and language, they are viewed as less capable of identifying with the mainstream culture and learning the mainstream language of society.

The challenge for education and policymakers is to shape the evolution of national identity in such a way that the rights of all citizens (including school children) are respected, and the cultural, linguistic, and economic resources of the nation are maximized. To waste the resources of the nation by discouraging children from developing their mother tongues is quite simply unintelligent from the point of view of national self-interest. A first step in providing an appropriate education for culturally and linguistically diverse children is to examine what existing research says about the role of children's mother tongues in their educational development.

In fact, the research is very clear. When children continue to develop their abilities in two or more languages throughout their primary school, they gain a deeper understanding of language and how to use it effectively. They have more practice in processing language, especially when they develop literacy in both. More than 150 research studies conducted during the past 35 years strongly support what Goethe, the famous eighteenth-century German philosopher, once said: the person who knows only one language does not truly know that language. Research suggests that bilingual children may also develop more flexibility in their thinking as a result of processing

information through two different languages.

The level of development of children's mother tongue is a strong predictor of their second language development. Children who come to school with a solid foundation in their mother tongue develop stronger literacy abilities in the school language. When parents and other caregivers (e.g. grandparents) are able to spend time with their children and tell stories or discuss issues with them in a way that develops their mother tongue, children come to school well prepared to learn the school language and succeed educationally. Children's knowledge and skills transfer across languages from the mother tongue to the school language. Transfer across languages can be two-way: both languages nurture each other when the educational environment permits children access to both languages.

Some educators and parents are suspicious of mother tongue-based teaching programs because they worry that they take time away from the majority language. For example, in a bilingual program where 50% of the time is spent teaching through children's home language and 50% through the majority language, surely children won't progress as far in the latter? One of the most strongly established findings of educational research, however, is that well-implemented bilingual programs can promote literacy and subject-matter knowledge in a minority language without any negative effects on children's development in the majority language. Within Europe, the Foyer program in Belgium, which develops children's speaking and literacy abilities in three languages (their mother tongue, Dutch and French), most clearly illustrates the benefits of bilingual and trilingual education (see Cummins, 2000).

It is easy to understand how this happens. When children are learning through a minority language, they are learning concepts and intellectual skills too. Pupils who know how to tell the time in their mother tongue understand the concept of telling time. In order to tell time in the majority language, they do not need to re-learn the concept. Similarly, at more advanced stages, there is transfer across languages in other skills such as knowing how to distinguish the main idea from the supporting details of a written passage or story, and distinguishing fact from opinion. Studies of secondary school pupils are providing interesting findings in this area, and it would be worth extending this research.

Many people marvel at how quickly bilingual children seem to "pick up" conversational skills in the majority language at school (although it takes much longer for them to catch up with native speakers in academic language skills). However, educators are often much less aware of how quickly children can lose their ability to use their mother tongue, even in the home context. The extent and rapidity of language loss will vary according to the concentration of families from a particular linguistic group in the neighborhood. Where the mother tongue is used extensively in the community, then language loss among young children will be less. However, where language communities are not concentrated in particular neighborhoods, children can lose their ability to communicate in their mother tongue within 2-3 years of starting school. They may retain receptive skills in the language, but they will use the majority language in speaking with their peers and siblings and in responding to their parents. By the time children become adolescents, the linguistic division between parents and children has become an emotional chasm. Pupils frequently become alienated from the cultures of both home and school with predictable results.

Questions 27 – 30

Choose the correct letter, A, B, C or D.

Write the correct letter in boxes 27 – 30 on your answer sheet.

27. What point did the writer make in the second paragraph?
- A. Some present studies on children's mother tongues are misleading.
 - B. A culturally rich education programme benefits some children more than others.
 - C. Bilingual children can make a valuable contribution to the wealth of a country.
 - D. The law on mother tongue use at school should be strengthened.
28. Why does the writer refer to something that Goethe said?
- A. to lend weight to his argument
 - B. to contradict some research
 - C. to introduce a new concept
 - D. to update current thinking
29. The writer believes that when young children have a firm grasp of their mother tongue
- A. they can teach older family members what they learnt at school.
 - B. they go on to do much better throughout their time at school.
 - C. they can read stories about their cultural background.
 - D. they develop stronger relationships with their family than with their peers.
30. Why are some people suspicious about mother-tongue based teaching programmes?
- A. They worry that children will be slow to learn to read in either language.
 - B. They think that children will confuse words in the two languages.
 - C. They believe that the programmes will make children less interested in their lessons.
 - D. They fear that the programmes will use up valuable time in the school day.

Questions 31 – 35

Complete the summary using the list of words, A – J, below. Write the correct letter A-J, in boxes 31-35 on your answer sheet.

Bilingual Children

It was often recorded that bilingual children acquire the 31..... to converse in the majority language remarkably quickly. The fact that the mother tongue can disappear at a similar 32..... is less well understood. This phenomenon depends, to a certain extent, on the proposition of people with the same linguistic background that have settled in a particular 33..... If this is limited, children are likely to lose the active use of their mother tongue. And thus no longer employ it even with 34....., although they may still understand it. It follows that teenager children in these circumstances experience a sense of 35..... in relation to all aspects of their lives.

A teachers	B school	C dislocation
D rate	E time	F family
G communication	H type	I ability
J area		

Questions 36 – 40

Do the following statements agree with the views of the writer in Reading passage 3? In boxes 36 – 40 on your answer sheet, write

- YES** if the statement agrees with the views of the writer
NO if the statement contradicts the views of the writer
NOT GIVEN if it is impossible to say what the writer thinks about it

36. Less than half of the children who attend kindergarten in Toronto have English as their mother tongue.
37. Research proves that learning the host country language at school can have an adverse effect on a child's mother tongue.
38. The Foyer program is accepted by the French education system.
39. Bilingual children are taught to tell the time earlier than monolingual children.
40. Bilingual children can apply reading comprehension strategies acquired in one language when reading in the other.

Reading 35

PASSAGE 1

THE VOYAGES OF THE PAST TIMES AND THEIR CONNECTIONS

- A. One feels a certain sympathy for Captain James Cook on the day in 1778 that he “discovered” Hawaii. Then on his third expedition to the Pacific, the British navigator had explored scores of islands across the breadth of the sea, from lush New Zealand to the lonely wastes of Easter Island. The latest voyage had taken him thousands of miles north from the Society Islands to an archipelago so remote that even the old Polynesians back on Tahiti knew nothing about it. Imagine Cook’s surprise, then, when the natives of Hawaii came paddling out in their canoes and greeted him in a familiar tongue, one he had heard virtually in every mote of inhabited land he had visited. Marveling at the ubiquity of this Pacific language and culture, he later wondered in his journal: “How shall we account for this Nation spreading itself so far over this vast ocean?”
- B. Answers have been slow in coming. But now a startling archaeological find on the island of Éfaté, in the Pacific nation of Vanuatu, has revealed an ancient seafaring people, the distant ancestors of today’s Polynesians, taking their first step into the unknown. The discoveries there have also opened a window into the shadowy world of those early voyagers. At the same time, other pieces of this human puzzle are turning up in unlikely places. Climate data gleaned from slow-growing corals around the Pacific and from sediments in alpine lakes in South America may help explain how, more than a thousand years later, a second wave of seafarers beat their way across the entire Pacific.
- C. “What we have is a first- or second-generation site containing the graves of some of the Pacific’s first explores,” says Spriggs, professor of archaeology at the Australian National University and co-leader of an international team excavating the site. It came to light only by luck. A backhoe operator, digging up topsoil in the ground of a derelict coconut plantation, scraped open a grave – the first of dozens in a burial ground some 3,000 years old. It is the oldest cemetery ever found in the Pacific islands, and it harbours the bones of an ancient people archaeologists call the Lapita, a label that derives from a beach in New Caledonia, where a landmark cache of their pottery was found in the 1950s. They were daring blue – water adventurers who roved the sea not just as explorers but also as pioneers, bringing along everything they would need to build new lives – their families and livestock, taro seedlings and stone tools.
- D. Within the span of a few centuries the Lapita stretched the boundaries of their world from the jungle clad volcanoes of Papua New Guinea to the loneliest coral outliners of Tonga, at least 2,000 miles eastward in the Pacific. Along the way they explored millions of square miles of unknown sea, discovering and colonizing scores of tropical islands never before seen by human eyes: Vanuatu, New Caledonia, Fiji, Samoa.
- E. What little is known or surmised about them has been pieced together from fragments of pottery, animal bones, obsidian flakes, and such oblique sources as comparative linguistics and geochemistry. Although their voyages can be traced back to the northern islands of Papua New Guinea, their language – variants of which still are spoken across the Pacific – came from Taiwan. And their peculiar style of pottery decoration, created by pressing a carved stamp into the clay, probably had its roots in the northern Philippines. With the discovery of the Lapita cemetery on

the Éfaté, the volume of data available to the researchers has expanded dramatically. The bones of at least 62 individuals have been uncovered so far – including old men, young women, even babies – and more skeletons are known to be in the ground. Archaeologists were also thrilled to discover six complete Lapita pots. It's an important find, Spriggs says, for it conclusively identifies the remains as Lapita. "It would be hard for anyone to argue that these aren't Lapita when you have human bones enshrined inside what is unmistakably a Lapita urn."

- F. Several lines of evidence also undergird Spriggs's conclusion that this was a community of pioneers making their first voyages into the remote reaches of Oceania. For one thing, the radiocarbon dating of bones and charcoal places them early in the Lapita expansion. For another, the chemical makeup of the obsidian flakes littering the site indicates that rock wasn't local; instead it was imported from a large island in Papua New Guinea's Bismarck Archipelago, the springboard for the Lapita's thrust into the Pacific. A particularly intriguing clue comes from chemical tests on the teeth of several skeletons. DNA teased from these ancient bones may also help answer one of the most puzzling questions in Pacific anthropology: Did all Pacific islanders spring from one source or many? Was there only one outward migration from a single point in Asia, or several from different points? "This represents the best opportunity we've had yet," says Spriggs, "to find out who the Lapita actually were, where they came from, and who their closest descendants are today."
- G. There is one stubborn question for which archaeology has yet to provide any answers: How did the Lapita accomplish the ancient equivalent of moon landing, many times over? No one has found one of their canoes or any rigging, which could reveal how the canoes were sailed. Nor do the oral histories and traditions of later Polynesians offer any insights, for they segue into the myth long before they reach as far back in time as the Lapita. "All we can say for certain is that the Lapita had canoes that were capable of ocean voyages, and they had the ability to sail them," says Geoff Irwin, a professor of archaeology at the University of Auckland and an avid yachtsman. Those sailing skills he says, were developed and passed down over thousands of years by early mariners who worked their way through the archipelagoes of the western Pacific, making short crossings to islands within sight of each other. Reaching Fiji, as they did a century or so later, meant crossing more than 500 miles of ocean, pressing on day after day into the great blue void of the Pacific. What gave them the courage to launch out on such a risky voyage?
- H. The Lapita's thrust into the Pacific was eastward, against the prevailing trade winds, Irwin notes. Those nagging headwinds, he argues, may have been the key to their success. "They could sail out for days into the unknown and reconnoiter, secure in the knowledge if they didn't find anything, they could turn about and catch a swift ride home on the trade winds. It's what made the whole thing work." Once out there, skilled seafarers would detect abundant leads to follow to land: seabirds and turtles, coconuts and twigs carried out to sea by the tides, and the afternoon pile up of clouds on the horizon that often betokens an island in the distance. Some islands may have broadcast their presence with far less subtlety than a cloud bank. Some of the most violent eruptions anywhere on the planet during the past 10,000 years occurred in Melanesia, which sits nervously in one of the most explosive volcanic regions on Earth. Even less spectacular eruptions would have sent plumes of smoke billowing into the stratosphere and rained ash for hundreds of miles. It's possible that the Lapita saw these signs of distant islands and later sailed off in their direction, knowing they would find land. For returning explorers, successful or not, the geography

of their own archipelagoes provided a safety net to keep them from overshooting their home ports and sailing off into eternity.

1. However, they did it. The Lapita spread themselves a third of the way across the Pacific, then called it quits for reasons known only to them. Ahead lay the vast emptiness of the central Pacific, and perhaps they were too thinly stretched to venture further. They probably never numbered more than a few thousand in total, and in their rapid migration eastward they encountered hundreds of islands – more than 300 in Fiji alone. Still, more than a millennium would pass before the Lapita's descendants, a people we now call the Polynesians, struck out in search of new territory.

Questions 1 – 7

Do the following statements agree with the claims of the writer in Reading Passage 1?

- YES** if the statement agrees with the claims of the writer
NO if the statement contradicts the claims of the writer
NOT GIVEN if it is impossible to say what the writer thinks about this

1. Captain Cook once expected the Hawaii to speak another language.
2. Captain Cook depicted numbers of cultural aspects of Polynesians in his journal.
3. Professor Spriggs and his research team went to the Éfaté to try to find the site of ancient cemetery.
4. The Lapita completed a journey of around 2,000 miles in a period less than a century.
5. The Lapita were the first inhabitants in many Pacific islands.
6. The urn buried in Éfaté site was plain as it was without any decoration.
7. The unknown pots discovered in Éfaté had once been used for cooking.

Questions 8 – 10

Complete the summary below. Choose **ONE WORD ONLY** from the passage for each answer. Write your answers in boxes 8 – 10 on your answer sheet.

Scientific Evidence Found in the Éfaté Site

Tests show the human remains and the charcoal found in the buried urn are from the start of the Lapita period. Yet the 8..... covering many of the Éfaté site did not come from that area.

Then examinations carried out on the 9..... discovered at the Éfaté site reveal that not everyone buried there was a native living in the area. In fact, DNA could assist in the identifying of the Lapita's nearest present-day 10.....

Questions 11 – 13

Answer the questions below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 11 – 13 on your answer sheet.

11. What did the Lapita travel in when they crossed the ocean?
12. In Irwin's view, what would the Lapita have relied on to bring them fast back to the base?
13. Which sea creatures would have been an indication to the Lapita of where to find land?

READING PASSAGE 2

ARE IQ AND CREATIVITY LINKED?

Everyone has creativity, some a lot more than others. The development of humans, and possibly the universe, depends on it. Yet creativity is an elusive creature. What do we mean by it? What is going on in our brains when ideas form? Does it feel the same for artists and scientists? We asked writers and neuroscientists, pop stars and AI gurus to try to deconstruct the creative process – and learn how we can all ignite the spark within.

In the early 1970s, creativity was still seen as a type of intelligence. But when more subtle tests of IQ and creative skills were developed in the 1970s, particularly by the father of creativity testing, Paul Torrance, it became clear that the link was not so simple. Creative people are intelligent, in terms of IQ tests at least, but only averagely or just above. While it depends on the discipline, in general beyond a certain level IQ does not help boost creativity; it is necessary, but not sufficient to make someone creative.

Because of the difficulty of studying the actual process, most early attempts to study creativity concentrated on personality. According to creativity specialist Mark Runco of California State University, Fullerton, the "creative personality" tends to place a high value on aesthetic qualities and to have broad interests, providing lots of resources to draw on and knowledge to recombine into novel solutions. "Creatives" have an attraction to complexity and an ability to handle conflict. They are also usually highly self-motivated, perhaps even a little obsessive.

But there may be a price to pay for having a creative personality. For centuries, a link has been made between creativity and mental illness. Psychiatrist Jaimson of John Hopkins University in Baltimore, Maryland, found that established artists are significantly more likely to have mood disorders. But she also suggests that a change of mood state might be the key to triggering a creative event, rather than the negative mood itself. Intelligence can help channel this thought style into great creativity, but when combined with emotional problems, lateral, divergent or open thinking can lead to mental illness instead.

John Peterson, a psychologist at the University of Toronto, Canada, believes he has identified a mechanism that could help explain this. He says that the brains of creative people seem more open to incoming stimuli than less creative types. Our senses are continuously feeding a mass of information into our brains, which have to block or ignore most of it to save us from being snowed under. Peterson calls this process latent inhibition, and argues that people who have less of it, and who have reasonably high IQ with a good working memory can juggle more of the data, and so may be open to more possibilities and ideas. The downside of extremely low latent inhibition may be a confused thought style that predisposes people to mental illness.

But what of the creative act itself? One of the first studies of the creative brain at work was by Colin Martindale, a psychologist from the University of Maine in Orono. Back in 1978, he used a network of scalp electrodes to record an electroencephalogram, a record of the pattern of brain waves, as people made up stories. Creativity has two stages: inspiration and elaboration, each characterized by very different states of mind. While people were dreaming up their stories, he found their brains were surprisingly quiet. The dominant activity was alpha waves, indicating a very low level of cortical arousal: a relaxed state, as though the conscious mind was quiet while the brain was making connections behind the scenes. It's the same sort of brain activity as in some stages of sleep, dreaming or rest, which could explain why sleep and relaxation can help people be creative. However, when these quiet-minded people were asked to work on their stories, the alpha wave activity dropped off and the brain became busier, revealing increased cortical arousal, more corraling of activity and more organized thinking. Strikingly, it was the people who showed the biggest difference in brain activity between the inspiration and development stages who produced the most creative storylines. Nothing in their background brain activity marked them as creative or uncreative. "It's as if the less creative person can't shift gear," says Guy Claxton, a psychologist at the University of Bristol, UK. "Creativity requires different kinds of thinking. Very creative people move between these states intuitively." Creativity, it seems, is about mental flexibility: perhaps not a two-step process, but a toggling between two states.

Paul Howard-Jones, who works with Claxton in Bristol, believes he has found another aspect of creativity. He asked people to make up a story based on three words and scanned their brains using functional magnetic resonance imaging. In one trial, people were asked not to try too hard and just report the most obvious story suggested by the words. In another, they were asked to be inventive. He also varied the words so it was easier or harder to link them. As people tried harder and came up with more creative tales, there was a lot more activity in a particular prefrontal brain region on the right-hand side. So part of creativity is a conscious process of evaluating and analyzing ideas. The test also shows that the more we try and are stretched, the more creative our minds can be.

And creativity need not always be a solitary, tortured affair, according to Teresa Amabile of Harvard Business School. Though there is a slight association between solitary writing or painting and negative moods or emotional disturbances, scientific creativity and workplace creativity seem much more likely to occur when people are positive and buoyant. In a decade-long study of real businesses, to be published soon, Amabile found that positive moods relate positively to creativity in organizations, and that the relationship is simple linear one. Creative thought also improves people's moods, her team found, so the process is circular.

Another often forgotten aspect of creativity is social. Vera John-Steiner of the University of New Mexico says that to be really creative you need strong social networks and trusting relationships, not just active neural networks. One vital characteristic of a highly creative person, she says, is that they have at least one other person in their life who doesn't think they are completely nuts.

Questions 14 – 17

Do the following statement agree with the information given in Reading Passage 2?

- TRUE** if the statement agrees with the information
FALSE if the statement contradicts the information
NOT GIVEN if there is no information on this

14. High IQ guarantees better creative ability in one person than that who achieves an average score in an IQ test.
15. In a competitive society, individuals' language proficiency is more important than other abilities.
16. A wider range of resources and knowledge can be integrated by more creative people into bringing about creative approaches.
17. A creative person does not necessarily suffer more mental illness.

Questions 18 – 22

Use the information in the passage to match the people (listed A – F) with the opinions or deeds below. Write the appropriate letter, A – F, in boxes 18 – 22 on your answer sheet.

List of People	
A	Jamison
B	Jordan Peterson
C	Guy Claxton
D	Paul Howard-Jones
E	Teresa Amabile
F	Vera John-Steiner

18. Instead of producing a negative mood, the shift of mood states may be an important factor of inducing a creative thinking.
19. Where the more positive moods individuals achieve, there is higher creativity in organisations.
20. Good interpersonal relationship and trust contribute to a person with more creativity.
21. Creativity demands an ability that can easily change among different kinds of thinking.
22. Creative minds can be upgraded if we put into more practice in assessing and processing ideas.

Questions 23 – 26

Complete the sentences below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 23 – 26 on your answer sheet.

But what of the creative act itself? In 1978, Colin Martindale made records of the pattern of brain waves as people made up stories applying a system constituted of many 23 _____. The two phases of creativity, such as 24 _____, were found. While people were still planning their stories, their brains showed little active sign and the mental activity showed a very relaxed state as the same sort of brain activity as in sleep, dreaming or rest. However, experiment proved the signal of 25 _____ went down and the brain became busier, revealing increased cortical arousal, when these people who were in a laidback state were required to produce their stories. Strikingly, it was found the person who was perceived to have the greatest 26 _____ in brain activity between the two stages, produced storylines with the highest level of creativity.

PASSAGE 3

FORESTS, THE HABITAT OF MONKEYS

AS AN EAST WIND blasts through a gap in the Cordillera de Tilarán, a rugged mountain range that splits northern Costa Rica in half, a female mantled howler monkey moves through the swaying trees of the forest canopy.

- A. Ken Glander, a primatologist from Duke University, gazes into the canopy, tracking the female's movements. Holding a dart gun, he waits with the infinite patience for the right moment to shoot. With great care, Glander aims and fires. Hit in the rump, the monkey wobbles. This howler belongs to a population that has lived for decades at Hacienda La Pacifica, a working cattle ranch in Guanacaste province. Other native primates – white-faced capuchin monkeys and spider monkeys – once were common in this area, too, but vanished after the Pan-American Highway was built nearby in the 1950s. Most of the surrounding land was clear-cut for pasture.
- B. Howlers persist at La Pacifica, Glander explains, because they are leaf eaters. They eat fruit, when it's available but, unlike capuchin and spider monkeys, do not depend on large areas of fruiting trees. "Howlers can survive anyplace you have half a dozen trees, because their eating habits are so flexible," he says. In forests, life is an arms race between trees and the myriad creatures that feed on leaves. Plants have evolved a variety of chemical defenses, ranging from bad-tasting tannis, which bind with plant-produced nutrients, rendering them indigestible, to deadly poisons, such as alkaloids and cyanide.
- C. All primates, including humans, have some ability to handle plant toxins. "We can detoxify a dangerous poison known as caffeine, which is deadly to a lot of animals," Glander says. For leaf-eaters, long-term exposure to a specific plant toxin can increase their ability to defuse the poison and absorb the leaf nutrients. The leaves that grow in regenerating forests, like those at La Pacifica, are actually more howler friendly than those produced by the undisturbed, centuries-old trees that survive farther south, in the Amazon Basin. In younger forests, trees put most of their limited energy into growing wood, leaves and fruit, so they produce much lower levels of toxin than do well-established, old-growth trees.
- D. The value of maturing forests to primates is a subject of study at Santa Rosa National Park, about 35 miles northwest of Hacienda La Pacifica. The park hosts populations not only of mantled howlers but also of white-faced capuchins and spider monkeys. Yet the forests there are young, most of them less than 50 years old. Capuchins were the first to begin using the reborn forests, when the trees were as young as 14 years. Howlers, larger and heavier than capuchins, need somewhat older trees, with limbs that can support their greater body weight. A working ranch at Hacienda La Pacifica also explains their population boom in Santa Rosa. "Howlers are more resilient than capuchins and spider monkeys for several reasons," Fedigan explains. "They can live within a small home range, as long as the trees have the right food for them. Spider monkeys, on the other hand, occupy a huge home range, so they can't make it in fragmented habitat."
- E. Howlers also reproduce faster than do other monkey species in the area. Capuchins don't bear their first young until about 7 years old, and spider monkeys do so even later, but howlers give birth for the first time at about 3.5 years of age. Also, while a female spider monkey will have a baby about once every four years, well-fed howlers can produce an infant every two years.

- F. The leaves howlers eat hold plenty of water, so the monkeys can survive away from open streams and water holes. This ability gives them a real advantage over capuchin and spider monkeys, which have suffered during the long, ongoing drought in Guanacaste.
- G. Growing human population pressures in Central and South America have led to persistent destruction of forests. During the 1990s, about 1.1 million acres of Central American forest were felled yearly. Alejandro Estrada, an ecologist at Estacion de Biologia Los Tuxtlas in Veracruz, Mexico, has been exploring how monkeys survive in a landscape increasingly shaped by humans. He and his colleagues recently studied the ecology of a group of mantled howler monkeys that thrive in a habitat completely altered by humans" a cacao plantation in Tabasco, Mexico. Like many varieties of coffee, cacao plants need shade to grow, so 40 years ago the landowners planted fig, monkey pod and other tall trees to form a protective canopy over their crop. The howlers moved in about 25 years ago after nearby forests were cut. This strange habitat, a hodgepodge of cultivated native and exotic plants, seems to support about as many monkeys as would a same-sized patch of wild forest. The howlers eat the leaves and fruit of the shade trees, leaving the valuable cacao pods alone, so the farmers tolerate them.
- H. Estrada believes the monkeys bring underappreciated benefits to such farms, dispersing the seeds of fig and other shade trees and fertilizing the soil with feces. He points out that howler monkeys live in shade coffee and cacao plantations in Nicaragua and Costa Rica as well as in Mexico. Spider monkeys also forage in such plantations, though they need nearby areas of forest to survive in the long term. He hopes that farmers will begin to see the advantages of associating with wild monkeys, which includes potential ecotourism projects.
- "Conservation is usually viewed as a conflict between agricultural practices and the need to preserve nature," Estrada says. "We're moving away from that vision and beginning to consider ways in which agricultural activities may become a tool for the conservation of primate in human-modified landscapes."

Questions 27 – 32

Reading Passage 3 has eight paragraphs, A – H. Which paragraph contains the following information? Write the correct letter, **A-H**, in boxes 27-32 on your answer sheet.

27. A reference of rate of reduction in forest habitats.
28. An area where only one species of monkey survived while other two species vanished.
29. A reason for howler monkeys to choose new leaves as food over old ones.
30. Mention of howler monkey's diet and eating habits.
31. A reference of asking farmers' to change attitude towards wildlife.
32. The advantage of howler monkey's flexibility in living in a segmented habitat.

Questions 33 -35

Look at the list of places and the following descriptions below. Match each description with the correct place, **A-E**. Write your answers, **A-E**, in boxes 33-35 on your answer sheet.

List of Places

- A Hacienda La Pacifica
- B Santa Rosa National Park
- C A cacao plantation in Tabasco, Mexico
- D Estacion de Biologia Los Tuxtlas in Veracruz, Mexico
- E Amazon Basin

- 33. A place where howler monkeys benefit the local region's agriculture.
- 34. A place where it is the original home for all three native monkeys.
- 35. A place where capuchin monkeys came to a better habitat.

Questions 36 – 40

Complete the sentences below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

The reasons why howler monkeys survive better in local region than the other two species

- Howlers live better in a La Pacifica since they can feed themselves with leaves when 36..... is not easily found.
- Howlers have better ability to alleviate the 37..... which old and young trees used to protect themselves.
- When compared to that of spider monkeys and capuchin monkeys, the 38..... rate of howlers is relatively faster (round for just every 2 years)
- The monkeys can survive away from open streams and water holes as the leaves that howlers eat hold high content of 39....., which helps them to resist the continuous 40..... in Guanacaste.

READING 36

PASSAGE 1

T-REX: WAS IT A HUNTER OR A SCAVENGER?

Jack Horner is an unlikely academic: his dyslexia is so bad that he has trouble reading a book. But he can read the imprint of life in sandstone or muddy shale across a distance of 100 years, and it is this gift that has made him curator of palaeontology at Montana State University's Museum of the Rockies, the leader of a multi-million dollar scientific project to expose a complete slice of life 68 million years ago, and a consultant to Steven Spielberg and other Hollywood figures.

His father had a sand and gravel quarry in Montana, and the young Horner was a collector of stones and bones, complete with notes about when and where he found them. "My father had owned a ranch when he was younger, in Montana," he says. "He was enough of a geologist, being a sand and a gravel man, to have a pretty good notion that they were dinosaur bones. So, when I was eight years old, he took me back to the area that had been his ranch, to where he had seen these big old bones. I picked up one. I am pretty sure it was the upper arm bone of a duckbilled dinosaur: it probably wasn't a duckbilled dinosaur but closely related to that. I catalogued it, and took good care of it, and then later when I was in high school, excavated my first dinosaur skeleton. It obviously started earlier than eight and I literally have been driven ever since. I feel like I was born this way."

Horner spent seven years at university, but never graduated. "I have a learning disability, I would call it a learning difference - dyslexia, they call it - and I just had a terrible time with English and foreign languages and things like that. For a degree in geology or biology they required two years of a foreign language. There was no way in the world I could do that. In fact, I didn't really pass English. So, I couldn't get a degree, I just wasn't capable of it. But I took all of the courses required and I wrote a thesis and I did all sorts of things. So, I have the education, I just don't have the piece of paper," he says.

"We definitely know we are working on a very broad coastal plain with the streams and rivers bordered by conifers and hardwood plants, and the areas in between these rivers were probably fern-covered. There were no grasses at all: just ferns and bushes - an unusual landscape, kind of taking the south-eastern United States - Georgia, Florida - and mixing it with the moors of England and flattening it out," he says. "Triceratops is very common: they are the cows of the Cretaceous, they are everywhere. Duckbilled dinosaurs are relatively common but not as common as triceratops and T-rex, for a meat-eating dinosaur, is very common. What we would consider the predator-prey ratio seems really off the scale. What is interesting is the little dromaeosaurs, the ones we know for sure were good predators, and haven't been found."

That is why he sees T-rex not as the lion of the Cretaceous savannah but its vulture. "Look at the wildebeest that migrate in the Serengeti of Africa, a million individuals lose about 200,000

individuals in that annual migration. There is tremendous carrion base there. And so you have hyenas, you have tremendous numbers of vultures that are scavenging, you don't have all that many animals that are good predators. If T-rex was a top predator, especially considering how big it is, you'd expect it to be extremely rare, much rarer than the little dromaeosaurs, and yet they are everywhere, that are a dime a dozen," he says. A 12-tonne T-rex is a lot of vulture, but he doesn't see the monster as clumsy. He insisted his theory and finding, dedicated to further research upon it, of course, he would like to reevaluate if there is any case that additional evidence found or explanation raised by others in the future.

He examined the leg bones of the T-rex, and compared the length of the thigh bone (upper leg) to the shin bone (lower leg). He found that the thigh bone was equal in length or slightly longer than the shin bone, and much thicker and heavier, which proves that the animal was built to be a slow walker rather than fast running. On the other hand, the fossils of fast hunting dinosaurs always showed that the shin bone was longer than the thigh bone. This same truth can be observed in many animals of today which are designed to run fast: the ostrich, cheetah, etc.

He also studied the fossil teeth of the T-rex, and compared them with the teeth of the Velociraptor, and put the nail in the coffin of the "hunter T-rex theory". The Velociraptor's teeth which are like steak knives: sharp, razor-edged, and capable of tearing through flesh with ease. The T-rex's teeth were huge, sharp at their tip, but blunt, propelled by enormous jaw muscles, which enabled them to only crush bones.

With the evidence presented in his documentary, Horner was able to prove that the idea of the T-rex as being a hunting and ruthless killing machine is probably just a myth. In light of the scientific clues he was able to unearth, the T-rex was a slow, sluggish animal which had poor vision, an extraordinary sense of smell, that often reached its "prey" after the real hunters were done feeding, and sometimes it had to scare the hunters away from a corpse. In order to do that, the T-rex had to have been ugly, nasty-looking, and stinky. This is actually true of nearly all scavenger animals. They are usually vile and nasty looking.

Questions 1 – 7

Do the following statements agree with the information given in Reading Passage 1?

In boxes 1 – 7 on your answer sheet, write

- | | |
|------------------|--|
| TRUE | if the statement agrees with the information |
| FALSE | if the statement contradicts the information |
| NOT GIVEN | if there is no information in this passage |

1. Jack Horner knew exactly that the bone picked up in his father's ranch belonged to a certain dinosaur when he was at the age of 8.
2. Jack Horner achieved a distinctive degree in university when he graduated.
3. Jack Horner believes that the number of prey should be more than that of predators.
4. T-rex's number is equivalent to the number of vulture in the Serengeti.
5. The hypothesis that T-rex is the top predator conflicts with the fact of predator-prey ratio which Jack found.
6. Jack Horner refused to accept any other viewpoints about T-rex's theory.
7. Jack Horner is the first man that discovered T-rex's bones in the world.

Questions 8 – 13

Complete the sentences below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 8 – 13 on your answer sheet.

Jack Horner found that T-rex's 8..... is shorter than the thigh bone, which demonstrates that it was actually a 9....., unlike other swift animals such as ostrich or 10..... that was built to 11..... Another explanation supports his idea is that T-rex's teeth were rather 12....., which only allowed T-rex to 13..... hard bones instead of tearing flesh like Velociraptor.

PASSAGE 2

THE INGENUITY OF THE LEAF-CUTTING ANTS

- A. The ants and their agriculture have been extensively studied over the years, but the recent research has uncovered intriguing new findings about the fungus they cultivate, how they domesticated it and how they cultivate it and preserve it from pathogens. For example, the fungus farms, which the ants were thought to keep free of pathogens, turn out to be vulnerable to a devastating mold, found nowhere else but in ants' nests. To keep the mold in check, the ants long ago made a discovery that would do credit to any pharmaceutical laboratory.
- B. Leaf-cutting ants and their fungus farms are a marvel of nature and perhaps the best known example of symbiosis, the mutual dependence of two species. The ants' achievement is remarkable – the biologist Edward O. Wilson has called it “one of the major breakthroughs in animal evolution” – because it allows them to eat, courtesy of their mushroom's digestive powers, the otherwise poisoned harvest of tropical forests whose leaves are laden with terpenoids, alkaloids and other chemicals designed to sicken browsers.

- C. Fungus growing seems to have originated only once in evolution, because all gardening ants belong to a single tribe, the descendants of the first fungus farmer. There are more than 200 known species of the attine ant tribe, divided into 12 groups, or genera. The leaf-cutters use fresh vegetation; the other groups, known as the lower attines because their nests are smaller and their techniques more primitive, feed their gardens with detritus like dead leaves, insects and feces. In 1994 a team of four biologists, Ulrich G. Mueller and Ted R. Schultz from Cornell University and Ignacio H. Chapela and Stephen A. Rehner from the United States Department of Agriculture, analyzed the DNA of ant funguses. The common assumption that the funguses are all derived from a single strain, they found, was only half true.
- D. The leaf-cutters' fungus was indeed descended from a single strain, propagated clonally, or just by budding, for at least 23 million years. But the lower attine ants used different varieties of the fungus, and in one case a quite separate species, the four biologists discovered. Cameron R. Currie, a Ph.D. student in the University of Toronto, was attracted to the ants because of his interest in symbiosis and in the cheaters who take advantage of that mutualism. The pure strain of fungus grown by the leaf-cutters, it seemed to Mr. Currie, resembled the monocultures of various human crops that are very productive for a while and then succumb to some disastrous pathogen, such as the Irish potato blight. Monocultures, which lack the genetic diversity to respond changing environmental threats, are sitting ducks for parasites. Mr. Currie felt there had to be a parasite in the ant-fungus system. But a century of any research offered no support for the idea. Textbooks describe how leaf-cutter ants scrupulously weed their gardens of all foreign organisms. "People kept telling me, 'You know the ants keep their gardens free of parasites, don't you?'" Mr. Currie said of his efforts to find a hidden interloper.
- E. But after three years of sifting through attine ant gardens, Mr. Currie discovered they are far from free of infections. In last month's issue of the Proceedings of the National Academy of Sciences, he and two colleagues, Dr. Mueller and David Mairoch, isolated several alien organisms, particularly a family of parasitic molds called Escovopsis. Escovopsis turns out to be a highly virulent pathogen that can devastate a fungus garden in a couple of days. It blooms like a white cloud, with the garden dimly visible underneath. In a day or two the whole garden is enveloped. "Other ants won't go near it and the ants associated with the garden just starve to death," Dr. Rehner said. "They just seem to give up, except for those that have rescued their larvae."
- F. Evidently the ants usually manage to keep Escovopsis and other parasites under control. But with any lapse in control, or if the ants are removed, Escovopsis will quickly burst forth. Although new leaf-cutter gardens start off free of Escovopsis, within two years some 60 percent become infected. The discovery of Escovopsis's role brings a new level of understanding to the evolution of the attine ants. "In the last decade, evolutionary biologists have been increasingly aware of the role of parasites as driving forces in evolution," Dr. Schultz said. There is now a possible reason to explain why the lower attine species keep changing the variety of fungus in their mushroom gardens, and occasionally domesticating new ones - to stay one step ahead of the relentless Escovopsis.
- G. Interestingly, Mr. Currie found that the leaf-cutters had in general fewer alien molds in their gardens than the lower attines, yet they had more Escovopsis infections. It seems that the price

they pay for cultivating a pure variety of fungus us a higher risk from Escovopsis. But the leaf-cutters may have little alternative: they cultivate a special variety of fungus which, unlike those grown by the lower attines, produces nutritious swollen tips of the ants to eat.

- H. Discovery of a third partner in the ant-fungus symbiosis raises the question of how the attine ants, especially the leaf-cutters, keep this dangerous interloper under control. Amazingly enough, Mr. Currie has again provided the answer. "People have known for a hundred years that ants have a whitish growth on the cuticle," said Dr. Mueller referring to the insects' body surface. "People would say this is like a cuticular wax. But Cameron was the first one in a hundred years to put these things under a microscope. He saw it was not inert wax. It is alive." Mr. Currie discovered a specialized patch on the ants' cuticle that harbours a particular kind of bacterium, one well known to the pharmaceutical industry, because it is the source of half the antibiotics used in medicine. From each of 22 species of attine ant studied, Mr. Cameron and colleagues isolated a species of *Streptomyces* bacterium, they reported in *Nature* in April. The *Streptomyces* does not have much effect on ordinary laboratory funguses. But it is a potent poisoner of Escovopsis, inhibiting its growth and suppressing spore formation. Because both the leaf-cutters and the lower attines use *Streptomyces*, the bacterium may have been part of their symbiosis for almost as long as the Escovopsis mold. If so, some Alexander Fleming of an ant discovered antibiotics millions of years before people did. Even now, the ants are accomplishing two feats beyond the powers of human technology. The leaf-cutters are growing a monocultural crop year after year without disaster, and they are using an antibiotic apparently so wisely and prudently that, unlike people, they are not provoking antibiotic resistance in the target pathogen.

Questions 14 – 19

Use the information in the passage to match the options (listed A–C) with the activities or features of ants below. Write the appropriate letters, A–C, in boxes 14-19 on your answer sheet. **NB** You may use any letter more than once.

- | | |
|----------|--|
| A | Leaf-cutting ants |
| B | Lower attine ants |
| C | Both leaf-cutting ants and lower attine ants |

14. can use toxic leaves to feed fungus
15. build small nests and live with different foreign fungus
16. use dead vegetation to feed fungus
17. raise a single fungus which do not live with other varieties of foreigners
18. normally keep a highly dangerous parasite under control
19. use special strategies to fight against Escovopsis

Questions 20 - 24

Reading Passage 2 has eight paragraphs, A - H. Which paragraph contains the following information? Write the correct letter, A - H, in boxes 20 - 24 on your answer sheet.

20. Dangerous outcome of Escovopsis
21. Risk of growing single fungus
22. Comparison of the features of two different nests for feeding gardens
23. Discovery of significant achievements made by ants earlier than human
24. Advantages of growing a new breed of fungus in the ant farm

Questions 25 - 26

Choose the correct letter, A, B, C or D. Write your answers in boxes 25-26 on your answer sheet.

25. What does the author think of Currie's opinion on the saying "ants keep their gardens free of parasites"?
 - A. His viewpoint was verified later.
 - B. his earlier study has sufficient evidence immediately.
 - C. There is no detail mentioned in the article.
 - D. His opinion was proved to be wrong later on.
26. What did scientists find on the skin of ants under microscope?
 - A. some white cloud mold embed in their skin
 - B. that wax is all over their skin
 - C. a substance which is useful to humans
 - D. a substance which suppresses growth of all fungus

PASSAGE 3

THE IMPORTANCE OF THE ENDANGERED HONEY-BEES

Can native pollinators fill the gap?

Recently, ominous headlines have described a mysterious ailment, colony collapse disorder (CCD), which is wiping out the honeybees that pollinate many crops. Without honeybees, the story goes, fields will be sterile, economies will collapse, and food will be scarce.

But what few accounts acknowledge is that what's at risk is not itself a natural state of affairs. For one thing, in the United States, where CCD was first reported and has had its greatest impacts, honeybees are not a native species. Pollination in modern agriculture isn't alchemy, it's industry. The total number of hives involved in the U.S. pollination industry has been somewhere between 2.5 million and 3 million in recent years. Meanwhile, American farmers began using large quantities of organophosphate insecticides, planted large-scale crop monocultures, and adopted "clean farming" practices that scrubbed native vegetation from field margin and roadsides. These practices killed many native bees outright - they're as vulnerable to insecticides as any agricultural pest - and made the agricultural landscape inhospitable to those that remained. Concern about these practices and their effect on pollinators isn't new, in her 1962 ecological alarm cry *Silent Spring*, Rachel Carson warned of a 'Fruitless Fall' that could result from the

disappearance of insect pollinators.

If that 'Fruitless Fall' has not yet occurred, it may be largely thanks to the honeybee, which farmers turned to, as the ability of wild pollinators to service crops declined. The honeybee has been semi-domesticated since the time of the ancient Egyptians, but it wasn't just familiarity that determined this choice: the bees' biology is in many ways suited to the kind of agricultural system that was emerging. For example, honeybee hives can be closed up and moved out of the way when pesticides are applied to a field. The bees are generalist pollinators, so they can be used to pollinate many different crops. And although they are not the most efficient pollinator of every crop, honeybees have strength in numbers, with 20,000 to 100,000 bees living in a single hive. "Without a doubt, if there was one bee you wanted for agriculture, it would be the honeybee," says Jim Cane, of the U.S. Department of Agriculture. The honeybee, in other words, has become a crucial cog in the modern system of industrial agriculture. That system delivers more food, and more kinds of it, to more place, more cheaply than ever before. But that system is also vulnerable, because making a farm field into the photosynthetic equivalent of a factory floor, and pollination into a series of continent-long assembly lines, also leaches out some of the resilience characteristics of natural ecosystems.

Breno Freitas, an agronomist in Brazil, pointed out that in nature such a high degree of specialization usually is a very dangerous game: it works well while all the rest is in equilibrium, but runs quickly to extinction at the least disbalance. In effect, by developing an agricultural system that is heavily reliant on a single pollinator species, we humans have become riskily overspecialized. And when a human-honeybee relationship is disrupted, as it has been by colony collapse disorder, the vulnerability of that agricultural system begins to become clear.

In fact, a few wild bees are already being successfully managed for crop pollination. "The problem is trying to provide native bees in adequate numbers on a reliable basis in a fairly short number of years in order to service the crop," Jim Cane says. You're talking millions of flowers per acre in a two-to three-week time frame, or less, for a lot of crops." On the other hand, native bees can be much more efficient pollinators of certain crops than honeybees, so you don't need as many to do the job. For example, about 750 blue orchard bees (*Osmia lignaria*) can pollinate a hectare of apples or almonds, a task that would require roughly 50,000 to 1,50,000 honeybees. There are bee tinkers engaged in similar work in many corners of the world. In Brazil, Breno Freitas has found that *Centris tarsata*, the native pollinator of wild cashew, can survive in commercial cashew orchards if growers provide a source of floral oils, such as by interplanting their cashew trees with Caribbean cherry.

In certain places, native bees may already be doing more than they're getting credit for it. Ecologist Rachael Winfree recently led a team that looked at pollination of four summer crops (tomato, watermelon, peppers, and muskmelon) at 29 farms in the region of New Jersey and Pennsylvania. Winfree's team identified 54 species of wild bees that visited these crops and found that wild bees were the most important pollinators in the system: even though managed honeybees were present on many of the farms, wild bees were responsible for 62 percent of flower visits in the study. In another study focusing specifically on watermelon, Winfree and her colleagues calculated that native bees alone could provide sufficient pollination at 90 percent of the 23 farms studied. By contrast, honeybees alone could provide sufficient pollination at only 78

percent of farms.

"The region I work in is not typical of the way most food is produced," Winfree admits. In the Delaware Valley, most farms and farm fields are relatively small, each farmer typically grows a variety of crops, and farms are interspersed with suburbs and other types of land use which means there are opportunities for homeowners to get involved in bee conservation, too. The landscape is a bee-friendly patchwork that provides a variety of nesting habitat and floral resources distributed among different kinds of crops, weedy field margins, fallow fields, suburban neighbourhoods, and semi natural habitat like old woodlots, all at a relatively small scale. In other words, "pollinator-friendly" farming practices would not only aid pollination of agricultural crops, but also serve as a key element in the overall conservation strategy for wild pollinators, and often aid other wild species as well.

Of course, not all farmers will be able to implement all of these practices. And researchers are suggesting a shift to a kind of polyglot agricultural system. For some small-scale farms, native bees may indeed be all that's needed. For larger operations, a suite of managed bees - with honeybees filling the generalist role and other, native bees pollinating specific crops - could be augmented by free pollination services from resurgent wild pollinators. In other words, they're saying, we still have an opportunity to replace a risky monoculture with something diverse, resilient, and robust.

Questions 27 - 30

Do the following statements agree with the claims of the writer in reading Passage 3? In boxes 27-30 on your answer sheet, write

- YES** if the statement agrees with the claims of the writer
NO if the statement contradicts the claims of the writer
NOT GIVEN if it is impossible to say what the writer thinks about this

27. In the United States, farmers use honeybees in a large scale over the past few years.
 28. Clean farming practice would be harmful to farmers' health.
 29. The blue orchard bee is the most efficient pollinator for every crop.
 30. It is beneficial to other local creatures to protect native bees.

Questions 31 - 35

Choose the correct letter **A, B, C**, or **D**. Write your answers in boxes 31-35 on your answer sheet.

31. The example of the 'Fruitless Fall' underlines the writer's point about

- A) needs for using pesticides.
 B) impacts of losing insect pollinators.
 C) vulnerabilities of native bees.
 D) benefits in building more pollination industries.

32. Why can honeybees adapt to the modern agricultural system?

- A) The honeybees can pollinate more crops efficiently.
 B) The bees are semi-domesticated since ancient times.
 C) Honeybee hives can be protected from pesticides.

D) The ability of wild pollinators using to serve crops declines.

33. The writer mentions factories and assembly lines to illustrate

- A) one drawback of the industrialised agricultural system.
- B) a low cost in modern agriculture.
- C) the role of honeybees in pollination.
- D) what a high yield of industrial agriculture.

34. In the 6th paragraph, Winfree's experiment proves that

- A) honeybees can pollinate various crops.
- B) there are many types of wild bees as the pollinators.
- C) wild bees can increase the yield to a higher percentage.
- D) wild bees work more efficiently as a pollinator than honeybees in certain cases.

35. What does the writer want to suggest in the last paragraph?

- A) the importance of honeybees in pollination
- B) the adoption of different bees in various sizes of agricultural system
- C) the comparison between the intensive and rarefied agricultural system
- D) the reason why farmers can rely on native pollinators

Questions 36 – 40

Complete each sentence with the correct ending, A-F, below.

Write the correct letter, A-F, in boxes 36-40 on your answer sheet.

36. Headlines of colony collapse disorder state that

37. Viewpoints of Freitas manifest that

38. Examples of blue orchard bees have shown that

39. *Centris tarsata* is mentioned to exemplify that

40. One finding of the research in Delaware valley is that

- A native pollinators can survive when a specific plant is supplied.
- B it would cause severe consequences to both commerce and agriculture.
- C honeybees cannot be bred.
- D some agricultural landscapes are favourable in supporting wild bees.
- E a large scale of honeybees are needed to pollinate.
- F an agricultural system is fragile when relying on a single pollinator.

READING 37

READING PASSAGE 1

THE TEACHING BEHAVIOUR OF ANTS

The ants are tiny and usually nest between rocks in the south coast of England. Transformed into research subjects at the University of Bristol, they raced along a tabletop foraging for food – and then, remarkably, returned to guide others. Time and again, followers trailed behind leaders, darting this way and that along the route, presumably to memorise landmarks. Once a follower got its bearings, it tapped the leader with its antennae, prompting the lesson to literally proceed to the next step. The ants were only looking for food, but the researchers said the careful way the leaders led the followers – thereby turning them into leaders in their own right – marked the *Temnothorax albipennis* ant as the very first example of a non-human animal exhibiting teaching behavior.

"Tandem running is an example of teaching, to our knowledge the first in a non-human animal, that involves bidirectional feedback between teacher and pupil," remarks Nigel Franks, professor of animal behavior and ecology, whose paper on the ant educators was published last week in the journal *Nature*.

No sooner was the paper published, of course, that another educator questioned it. Marc Hauser, a psychologist and biologist and one of the scientists who came up with the definition of teaching, said it was unclear whether the ants had learned a new skill or merely acquired new information.

Later, Frank took a further study and found that there were even races between leaders. With the guidance of leaders, ants could find food faster. But the help comes at a cost for the leader, who normally would have reached the food about four times faster if not hampered by a follower. This means the hypothesis that the leaders deliberately slowed down in order to pass the skills on to the followers seems potentially valid. His ideas were advocated by the students who carried out the video project with him.

Opposing views still arose, however. Hauser noted that mere communication of information is commonplace in the animal world. Consider a species, for example, that uses alarm calls to warn fellow members about the presence of a predator. Sounding the alarm can be costly, because the animal may draw the attention of the predator to itself. But it allows others to flee to safety. "Would you call this teaching?" wrote Hauser. "The caller incurs a cost. The naïve animals gain a benefit and new knowledge that better enables them to learn about the predator's location than if the caller had not called. This happens throughout the animal kingdom, but we don't call it teaching, even though it is clearly transfer of information."

Tim Caro, a zoologist, presented two cases of animal communication. He found that cheetah mothers that take their cubs along on hunts gradually allow their cubs to do more of the hunting – going, for example, from killing a gazelle and allowing young cubs to eat to merely tripping the gazelle and letting the cubs finish it off. At one level, such behavior might be called teaching – except the mother was not really teaching the cubs to hunt but merely facilitating various stages of learning. In another instance, birds watching other birds using a stick to locate food such as insects and so on, are observed to do the same thing themselves while finding food later.

Psychologists study animal behavior in part to understand the evolutionary roots of human behavior, Hauser said. The challenge in understanding whether other animals truly teach one another, he added, is that human teaching involves a "theory of mind" – teachers are aware that students don't know something. He questioned whether Frank's leader ants really knew that the follower ants were ignorant. Could they simply have been following an instinctive rule to proceed when the followers tapped them on the legs or abdomen? And did leaders that led the way to food – only to find that it had been removed by the experimenter – incur the wrath of followers? That, Hauser said, would suggest that the follower ant actually knew the leader was more knowledgeable and not merely following an instinctive routine itself.

The controversy went on, and for a good reason. The occurrence of teaching in ants, if proven to be true, indicates that teaching can evolve in animals with tiny brains. It is probably the value of information in social animals that determines when teaching will evolve, rather than the constraints of brain size.

Bennett Galef Jr., a psychologist who studies animal behavior and social learning at McMaster University in Canada, maintained that ants were unlikely to have a "theory of mind" – meaning that leaders and followers may well have been following instinctive routines that were not based on an understanding of what was happening in another ant's brain. He warned that scientists may be barking up the wrong tree when they look not only for examples of humanlike behavior among other animals but humanlike thinking that underlies such behavior. Animals may behave in ways similar to humans without a similar cognitive system, he said, so the behavior is not necessarily a good guide into how humans came to think the way they do.

Questions 1 – 5

Look at the following statements (Questions 1-5) and the list of people in the box below. Match each statement with the correct person A, B, C, or D.

Write the correct letter A, B, C or D, in boxes 1-5 on your answer sheet.

NB You may use any letter more than once.

1. Animals could use objects to locate food.
2. Ants show two-way, interactive teaching behaviours.
3. It is risky to say ants can teach other ants like human beings do.
4. Ant leadership makes finding food faster.
5. Communication between ants is not entirely teaching.

List of People	
A	Nigel Franks
B	Mark Hauser.
C	Tim Caro
D	Bennett Galef Jr.

Questions 6 - 9

Choose **FOUR** letters, **A - H**. Write your answers in boxes 6-9 on your answer sheet.

Which **FOUR** of the following behaviours of animals are mentioned in the passage?

- A touch each other with antenna
- B alert others when there is danger
- C escape from predators
- D protect the young
- E hunt food for the young
- F fight with each other
- G use tools like twigs
- H feed on a variety of foods

Questions 10 -13

Do the following statements agree with the claims of the writer in Reading Passage 1? In boxes 10-13 on your answer sheet, write

- YES** if the statement agrees with the claims of the writer
NO if the statement contradicts the claims of the writer
NOT GIVEN if it is impossible to say what the writer thinks about this

- 10. Ants' tandem running involves only one-way communication.
- 11. Franks's theory for many supporters immediately after publicity.
- 12. Ants' teaching behavior is the same as that of human.
- 13. Cheetah share hunting gains to younger ones.

READING PASSAGE 2

THE EVOLUTION OF PLASTIC

When rubber was first commercially produced in Europe during the nineteenth century, it rapidly became a very important commodity, particularly in the fields of transportation and electricity. However, during the twentieth century a number of new synthetic materials, called plastics, superseded natural rubber in all but a few applications.

Rubber is a polymer - a compound containing large molecules that are formed by the bonding of many smaller, simpler units, repeated over and over again. The same bonding principle - polymerization - underlies the creation of a huge range of plastics by the chemical industry.

The first plastic was developed as a result of a competition in the USA. In the 1860s, \$10,000 was offered to anybody who could replace ivory - supplies of which were declining - with something equally good as a material for making billiard balls. The prize was won by John Wesley Hyatt with a material called celluloid. Celluloid was made by dissolving cellulose, a carbohydrate derived from plants, in a solution of camphor dissolved in ethanol. This new material rapidly found uses

in the manufacture of products such as knife handles, detachable collars and cuffs, spectacle frames and photographic film. Without celluloid, the film industry could never have got off the ground at the end of the 19th century.

Celluloid can be repeatedly softened and reshaped by heat and is known as a thermoplastic. In 1907 Leo Baekeland, a Belgian chemist working in the USA, invented a different kind of plastic by causing phenol and formaldehyde to react together. Baekeland called the material Bakelite, and it was the first of the thermosets – plastics that can be cast and moulded while hot, but cannot be softened by heat and reshaped once they have set. Bakelite was a good insulator and was resistant to water, acids and moderate heat. With these properties it was soon being used in the manufacture of switches, household items, such as knife handles, and electrical components for cars.

Soon chemists began looking for other small molecules that could be strung together to make polymers. In the 1930s, British chemists discovered that the gas ethylene would polymerise under heat and pressure to form a thermoplastic they called *polythene*. *Polypropylene* followed in the 1950s. Both were used to make bottles, pipes and plastic bags. A small change in the starting material – replacing a hydrogen atom in ethylene with a chlorine atom – produced PVC (polyvinyl chloride), a hard, fireproof plastic suitable for drains and gutters. And by adding certain chemicals, a soft form of PVC could be produced, suitable as a substitute for rubber in items such as waterproof clothing. A closely related plastic was *Teflon*, or *PTFE* (*polytetrafluoroethylene*). This had a very low coefficient of friction, making it ideal for bearings, rollers, and non-stick frying pans. *Polystyrene*, developed during the 1930s in Germany, was a clear, glass-like material, used in food containers, domestic appliances and toys. Expanded polystyrene – a white, rigid foam – was widely used in packaging and insulation. *Polyurethanes*, also developed in Germany, found uses as adhesives, coatings, and – in the form of rigid foams – as insulation materials. They are all produced from chemicals derived from crude oil, which contains exactly the same elements – carbon and hydrogen – as many plastics.

The first of the man-made fibres, nylon, was also created in the 1930s. Its inventor was a chemist called Wallace Carothers, who worked for the Du Pont company in the USA. He found that under the right conditions, two chemicals – hexamethylenediamine and adipic acid – would form a polymer that could be pumped out through holes and then stretched to form long glossy threads that could be woven like silk. Its first use was to make parachutes for the US armed forces in World War II. In the post-war years nylon completely replaced silk in the manufacture of stockings. Subsequently many other synthetic fibres joined nylon, including Orlon, Acrilan and Terylene. Today most garments are made of a blend of natural fibres, such as cotton and wool, and man-made fibres that make fabrics easier to look after.

The great strength of plastic is its indestructibility. However, this quality is also something of a

drawback: beaches all over the world, even on the remotest islands, are littered with plastic bottles that nothing can destroy. Nor is it very easy to recycle plastics, as different types of plastic are often used in the same items and call for different treatments. Plastics can be made biodegradable by incorporating into their structure a material such as starch, which is attacked by bacteria and causes the plastic to fall apart. Other materials can be incorporated that gradually decay in sunlight - although bottles made of such materials have to be stored in the dark, to ensure that they do not disintegrate before they have been used.

Questions 14 - 20

Complete the table below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 14-20 on your answer sheet.

Name of plastic	Date of invention	Original region	Property	Common use
Celluloid	1860s	US		14 _____
15 _____	1907	US	Can be cast and moulded but cannot be softened by heat	16 _____ household items and car parts
Polythene	1930s	17 _____		Bottles
Rigid PVC			18 _____	
Polystyrene	1930s	Germany	19 _____	Food container
Polyurethanes		Germany	20 _____ foams	Adhesives, coatings and insulation

Questions 21 - 26

Do the following statements agree with the information given in Reading Passage 2?

In boxes 21 -26 on your answer sheet, write

TRUE

if the statement agrees with the information

FALSE

If the statement contradicts the information

NOT GIVEN

if there is no information on this

21. The chemical structure of plastic is very different from that of rubber.
22. John Wesley was a famous chemist.
23. Celluloid and Bakelite react to heat in the same way.
24. The mix of different varieties of plastic can make the recycling more difficult.
25. Adding starch into plastic can make plastic more durable.
26. Some plastic containers have to be preserved in special conditions.

READING PASSAGE 3

THE EFFECT OF GLOBAL WARMING IN NEW ZEALAND

For many environmentalists, the world seems to be getting warmer. As the nearest country of South Polar Region, New Zealand has maintained an upward trend in its average temperature in the past few years. However, the temperature in New Zealand will go up 4 °C in the next century while the polar region will go up more than 6 °C. The different pictures of temperature stem from its surrounding ocean which acts like the air conditioner. Thus, New Zealand is comparatively fortunate.

Scientifically speaking, this temperature phenomenon in New Zealand originated from what researchers call "SAM" (Southern Annular Mode), which refers to the wind belt that circles the Southern Oceans including New Zealand and Antarctica. Yet recent work has revealed that changes in SAM in New Zealand have resulted in a weakening of moisture during the summer, and more rainfall in other seasons. A bigger problem may turn out to be heavier droughts for agricultural activities because of more water loss from soil, resulting in poorer harvest before winter when the rainfall arrives too late to rescue.

Among all the calamities posed by drought, moisture deficit ranks the first. Moisture deficit is the gap between the water plants need during the growing season and the water the earth can offer. Measures of moisture deficit were at their highest since the 1970s in New Zealand. Meanwhile, ecological analyses clearly show moisture deficit is imposed at different growth stage of crops. If moisture deficit occurs around a crucial growth stage, it will cause about 22% reduction in grain yield as opposed to moisture deficit at vegetative phase.

Global warming is not only affecting agriculture production. When scientists say the country's snow pack and glaciers are melting at an alarming rate due to global warming, the climate is putting another strain on the local places. For example, when the development of global warming is accompanied by the falling snow line, the local skiing industry comes into a crisis. The snow line may move up as the temperature goes up, and then the snow at the bottom will melt earlier. Fortunately, it is going to be favourable for the local skiing industry to tide over tough periods since the quantities of snowfall in some areas are more likely to increase.

What is the reaction of glacier region? The climate change can be reflected in the glacier region in southern New Zealand or land covered by ice and snow. The reaction of a glacier to a climatic change involves a complex chain of processes. Over time periods of years to several decades, cumulative changes in mass balance cause volume and thickness changes, which will affect the flow of ice via altered internal deformation and basal sliding. This dynamic reaction finally leads to glacier length changes, the advance or retreat of glacier tongues. Undoubtedly, glacier mass balance is a more direct signal of annual atmospheric conditions.

The latest research result of National Institute of Water and Atmospheric (NIWA) Research shows that glaciers line keeps moving up because of the impacts of global warming. Further losses of ice can be reflected in Mt. Cook region. By 1996, a 14 km long sector of the glacier had melted down, forming a melt lake (Hooker Lake) with a volume. Melting of the glacier front at a rate of 40 m/yr will cause the glacier to retreat at a rather uniform rate. Therefore, the lake will continue to grow until it reaches the glacier bed.

A direct result of the melting glaciers is the change of high tides that serves the main factor for sea level rise. The trend of sea level rise will bring a threat to the groundwater system for its hyper-saline groundwater and then pose a possibility to decrease the agricultural production. Many experts believe that the best way to consider this trend is to give a longer-term view of sea level change in New Zealand. Indeed, the coastal boundaries need to be upgraded and redefined.

There is no doubt that global warming has affected New Zealand in many aspects. The emphasis on the global warming should be based on the joint efforts of local people and experts who conquer the tough period. For instance, farmers are taking a long term, multi-generational approach to adjust the breeds and species according to the temperature. Agriculturalists also find ways to tackle problems that may bring to the soil. In broad terms, going forward, the systemic resilience that's been going on a long time in the ecosystem will continue.

How about animals' reaction? Experts have surprisingly realised that animals have unconventional adaptation to global warming. A study has looked at sea turtles on a few northern beaches in New Zealand and it is very interesting to find that sea turtles can become male or female according to the temperature. Further, researches will try to find out how rising temperatures would affect the ratio of sex reversal in their growth. Clearly, the temperature of the nest plays a vital role in the sexes of the baby turtles.

Tackling the problems of global warming is never easy in New Zealand, because records show the slow process of global warming may have a different impact on various regions. For New Zealand, the emission of carbon dioxide only accounts for 0.5% of the world's total, which has met the government standard. However, New Zealand's effort counts only a tip of the iceberg. So far, global warming has been a world issue that still hangs in an ambiguous future.

Questions 27 - 32

Choose the correct letter, A, B, C or D. Write the correct letter in boxes 27-32.

27. What is the main idea of the first paragraph?
- A. The temperature in the polar region will increase less than that in New Zealand in the next century.
 - B. The weather and climate of New Zealand is very important to its people because of its close location to the polar region.
 - C. The air condition in New Zealand will maintain a high quality because of the ocean.
 - D. The temperature of New Zealand will increase less than that of other regions in the next 100 years because it is surrounded by sea.
28. What is one effect of the wind belt that circles the Southern Oceans?
- A. New Zealand will have more moisture in winds in summer.
 - B. New Zealand needs to face droughts more often in hotter months in a year.
 - C. Soil water will increase as a result of weakening moisture in the winds.
 - D. Agricultural production will be reduced as a result of a more rainfall in other seasons.
29. What does "moisture deficit" mean to the grain and crops?
- A. The growing condition will be very tough for crops.
 - B. The growing season of some plants can hardly be determined.
 - C. There will be a huge gap between the water plants needed and the water the earth can offer.
 - D. The soil of grain and crops in New Zealand reached its lowest production since 1970s.
30. What changes will happen to skiing industry due to the global warming phenomenon?
- A. The skiing station may lower altitude of skiing.
 - B. Part of the skiing station needs to move to the north.
 - C. The snowfall may increase in part of the skiing station.
 - D. The local skiing station may likely to make profit because of the snowfall increase.
31. Cumulative changes over a long period of time in mass balance will lead to
- A. alterations in the volume and thickness of glaciers.
 - B. faster changes in internal deformation and basal sliding.
 - C. larger length of glaciers.
 - D. retreat of glacier tongues as a result of change in annual atmospheric conditions.

32. Why does the writer mention NIWA in the sixth paragraph?
- A. To use a particular example to explain the effects brought by glacier melting.
 - B. To emphasize the severance of the further loss of ice in Mt. Cook Region.
 - C. To alarm the reader of melting speed of glaciers at a uniform rate.
 - D. To note the lake in the region will disappear when it reaches the glacier bed.

Questions 33 - 35

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes 33-35 on your answer sheet.

Research data shows that sea level has a close relation with the change of climate. The major reason for the increase in sea level is connected with 33 _____.
The increase in sea level is also said to have a threat to the underground water system, the destruction of which caused by the rise of sea level will lead to a high probability of reduction in 34 _____. In the long run, New Zealanders may have to improve the 35 _____ if they want to diminish the effect of change in sea levels.

Questions 36 - 40

Do the following statements agree with the information given in Reading Passage 3? In boxes 36-40 on your answer sheet, write

- | | |
|------------------|--|
| YES | if the statement agrees with the claims of the writer |
| NO | if the statement contradicts the claims of the writer |
| NOT GIVEN | if it is impossible to say what the writer thinks about this |

- 36. Farmers are less responsive to climate change than agriculturalists.
- 37. Agricultural sector is too conservative and resistant to deal with climate change.
- 38. Turtle is vulnerable to climate change.
- 39. The global warming is going slowly, and it may have different effects on different areas in New Zealand.
- 40. New Zealand must cut carbon dioxide emission if they want to solve the problem of global warming.

READING 38

SECTION 1

THE INNOVATION OF THE MODERN GROCERY STORES

- A. At the beginning of the 20th century, grocery stores in the United States were full-service. A customer would ask a clerk behind the counter for specific items and the clerk would package the items, which were limited to dry goods. If they wanted to save some time, they had to ask a delivery boy or by themselves send the note of what they want to buy to the grocery store first and then go to pay for the goods later. These grocery stores usually carried only one brand of each good. There were early chain stores, such as the A&P Stores, but these were all entirely full-service and very time-consuming.
- B. In 1885, a Virginia boy named Clarence Saunders began working part-time as a clerk in a grocery store when he was 14 years old, and quit school when the shopkeeper offered him full time work with room and board. Later he worked in an Alabama coke plant and in a Tennessee sawmill before he returned to the grocery business. By 1900, when he was nineteen years old, he was earning \$30 a month as a salesman for a wholesale grocer. During his years working in the grocery stores, he found that it was very inconvenient and inefficient for people to buy things because more than a century ago, long before there were computers, shopping was done quite differently than it is today. Entering a store, the customer would approach the counter (or wait for a clerk to become available) and place an order, either verbally or, as was often the case for boys running errands, in the form of a note or list. While the customer waited, the clerk would move behind the counter and throughout the store, select the items on the list—some from shelves so high that long-handled grasping device had to be used—and bring them back to the counter to be tallied and bagged or boxed. The process might be expedited by the customer calling or sending in the order beforehand, or by the order being handled by a delivery boy on a bike, but otherwise it did not vary greatly. Saunders, a flamboyant and innovative man, noticed that this method resulted in wasted time and expense, so he came up with an unheard-of solution that would revolutionize the entire grocery industry: he developed a way for shoppers to serve themselves.
- C. So, in 1902 he moved to Memphis where he developed his concept to form a grocery wholesale cooperative and a full-service grocery store. For his new "cafeteria grocery", Saunders divided his grocery into three distinct areas: 1) A front "lobby" forming an entrance and exit and checkouts at the front. 2) A sales department, which was specially designed to allow customers to roam the aisles and select their own groceries. Removing unnecessary clerks, creating elaborate aisle displays, and rearranging the store to force customers to view all of the merchandise and over the shelving and cabinets units of sales department were "galleries" where supervisors were allowed to keep an eye on the customers while not disturbing them. 3) And another section of his store is the room only allowed for the clerks which was called the "stockroom" or "storage room" where large refrigerators were situated to keep fresh products from perishing. The new format allowed multiple customers to shop at the same time and led to the previously unknown

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phenomenon of impulse shopping. Though this format of grocery market was drastically different from its competitors, the style became the standard for the modern grocery store and later supermarket.

- D. On September 6, 1916, Saunders launched the self-service revolution in the USA by opening the first self-service Piggly Wiggly store, at 79 Jefferson Street in Memphis, Tennessee, with its characteristic turnstile at the entrance. Customers paid cash and selected their own goods from the shelves. It was unlike any other grocery store of that time. Inside a Piggly Wiggly, shoppers were not at the mercy of shop clerks. They were free to roam the store, check out the merchandise and get what they needed with their own two hands and feet. Prices on items at Piggly Wiggly were clearly marked. No one pressured customers to buy milk or pickles. And the biggest benefit at the Piggly Wiggly was that shoppers saved money. Self-service was a positive all around. "It's good for both the consumer and retailer because it cuts costs," noted George T. Haley, a professor at the University of New Haven and director of the Center for International Industry Competitiveness. "If you looked at the way grocery stores were run previous to Piggly Wiggly and Alpha Beta, what you find is that there was a tremendous amount of labor involved, and labor is a major expense," Piggly Wiggly cut the fat.
- E. Piggly Wiggly and the self-service concept took off, Saunders opened nine stores in the Memphis area within the first year of business. Consumers embraced the efficiency, the simplicity and most of all the lower food prices. Saunders soon patented his self-service concept and began franchising Piggly Wiggly stores. Thanks to the benefits of self-service and franchising, Piggly Wiggly ballooned to nearly 1,300 stores by 1923. Piggly Wiggly sold \$100 million — worth \$1.3 billion today — in groceries, making it the third-biggest grocery retailer in the nation. The company's stock was even listed on the New York Stock Exchange, doubling from late 1922 to March 1923. Saunders had his hands all over Piggly Wiggly. He the design and layout of his stores. He even invented the turnstile.
- F. However, Saunders was forced into bankruptcy in 1923 after a dramatic spat with the New York Stock Exchange and he went on to create the sole-owner-of-my-name" chain, which went into bankruptcy.
- G. Until the time of his death in October 1953, Saunders was developing plans for another automatic store system called the Food electric. But the store, which was to be located two blocks from the first Piggly Wiggly store, never opened. But his name was well-remembered along with the name Piggly Wiggly.

Questions 1-5

Which paragraph contains the following information? Write the correct letter A-G in boxes 1-5 on your answer sheet. NB You may use any letter more than once

1. How Clarence Saunders new idea had been carried out.
2. Introducing the modes and patterns of groceries before his age.
3. Clarence Saunders declared bankruptcy a few years later.
4. Descriptions of Clarence Saunders' new conception.
5. The booming development of his business.

Questions 6-10

Answer the questions below. Write ONLY ONE WORD AND/OR A NUMBER from the passage.

6. When Clarence Saunders was an adolescent, he took a job as a in a grocery store.
7. In the new innovation of grocery store, most of the clerks' work before was done by.....
8. In Saunders' new grocery store, the section where customers finish the payment was called
9. Another area in his store which behind the public area was called the where only internal staff could access.
10. At..... where customers were under surveillance.

Questions 11-13

Choose the correct letter, A, B, C or D. Write your answers in boxes 11-13

11. Why did Clarence Saunders want to propel the innovation of grocery stores at his age?
 - A. Because he was an enthusiastic and creative man.
 - B. Because his boss wanted to reform the grocery industry.
 - C. Because he wanted to develop its efficiency and make great profit as well.
 - D. Because he worried about the future competition from the industry.
12. What happened to Clarence Saunders' first store of Piggly Wiggly?
 - A. Customers complained about its impracticality and inconvenience.
 - B. It enjoyed a great business and was updated in the first twelve months.
 - C. It expanded to more than a thousand franchised stores during the first year.
 - D. Saunders was required to have his new idea patented and open more stores.
13. What left to Clarence Saunders after his death in 1953?
 - A. A fully automatic store system opened soon near his first store.
 - B. The name of his store the Piggly Wiggly was very popular at that time.
 - C. His name was usually connected with his famous shop the Piggly Wiggly in the following several years.
 - D. His name was painted together with the name of his famous store.

SECTION 2

CAUSES OF OBESITY AND THE CHALLENGES IN WEIGHT LOSS

The field of weight loss is like the ancient fable about the blind men and the elephant. Each man investigates a different part of the animal and reports back, only to discover their findings are bafflingly incompatible.

- A. The various findings by public-health experts, physicians, psychologists, geneticists, molecular biologists, and nutritionists are about as similar as an elephant's tusk is to its tail. Some say obesity is largely predetermined by our genes and biology; others attribute it to an overabundance of fries, soda, and screen-sucking; still others think we're fat because of viral infection, insulin, or theory," says Robert Berkowitz, medical director of the Center for Weight and Eating Disorders at the University of Pennsylvania School of Medicine. We're programmed to hang onto the fat we have, and some people are predisposed to create and carry more fat than others. Diet and exercise help, but in the end the solution will inevitably be more complicated than pushing away the plate and going for a walk. "It's not as simple as 'You're fat because you're lazy,'" says Nikhil Dhûrandhar, an associate professor at Pennington Biomedical Research Center in Baton Rouge. "Willpower is not a prerogative of thin people. It's distributed equally."
- B. Science may still be years away from giving us a miracle formula for fat-loss. Hormone leptin is a crucial player in the brain's weight-management circuitry. Some people produce too little leptin; others become desensitized to it. And when obese people lose weight, their leptin levels plummet along with their metabolism. The body becomes more efficient at using fuel and conserving fat, which makes it tough to keep the weight off. Obese dieters' bodies go into a state of chronic hunger, a feeling Rudolph Leibel, an obesity researcher at Columbia University, compares to thirst. "Some people might be able to tolerate chronic thirst, but the majority can't stand it," says Leibel. "Is that a behavioral problem—a lack of willpower? I don't think so."
- C. The government has long espoused moderate daily exercise—of the evening-walk or take-the-stairs variety—but that may not do much to budge the needle on the scale. A 150-pound person burns only 150 calories on a half-hour walk, the equivalent of two apples. It's good for the heart, less so for the gut. "Radical changes are necessary," says Deirdre Barrett, a psychologist at Harvard Medical School and author of *Waistland*. "People don't lose weight by choosing the small fries or taking a little walk every other day." Barrett suggests taking a cue from the members of the National Weight Control Registry (NWCR), a self-selected group of more than 5,000 successful weight-losers who have shed an average of 66 pounds and kept it off 5.5 years. Some registry members lost weight using low-carb diets; some went low-fat others eliminated refined foods. Some did it on their own; others relied on counseling. That said, not everyone can lose 66 pounds and not everyone needs to. The goal shouldn't be getting thin, but getting healthy. It's enough to whittle your weight down the low end of your set range, says Jeffrey Friedman, a geneticist at Rockefeller University. Losing even 10 pounds vastly decreases your risk of diabetes, heart
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disease, and high blood pressure. The point is to not give up just because you don't look like a swimsuit model.

- D. The negotiation between your genes and the environment begins on day one. Your optimal weight, written by genes, appears to get edited early on by conditions even before birth, inside the womb. If a woman has high blood-sugar levels while she's pregnant, her children are more likely to be overweight or obese, according to a study of almost 10,000 mother-child pairs. Maternal diabetes may influence a child's obesity risk through a process called metabolic imprinting, says Teresa Hillier, an endocrinologist with Kaiser Permanente's Center for Health Research and the study's lead author. The implication is clear: Weight may be established very early on, and obesity largely passed from mother to child. Numerous studies in both animals and humans have shown that a mother's obesity directly increases her child's risk for weight gain. The best advice for moms-to-be: Get fit before you get pregnant. You'll reduce your risk of complications during pregnancy and increase your chances of having a normal-weight child.
- E. It's the \$64,000 question: Which diets work? It got people wondering: Isn't there a better way to diet? A study seemed to offer an answer. The paper compared two groups of adults: those who, after eating, secreted high levels of insulin, a hormone that sweeps blood sugar out of the bloodstream and promotes its storage as fat, and those who secreted less. Within each group, half were put on a low-fat diet and half on a low-glycemic-load diet. On average, the low-insulin-secreting group fared the same on both diets, losing nearly 10 pounds in the first six months — but they gained about half of it back by the end of the 18-month study. The high-insulin group didn't do as well on the low-fat plan, losing about 4.5 pounds, and gaining back more than half by the end. But the most successful were the high-insulin-secretors on the low-glycemic-load diet. They lost nearly 13 pounds and kept it off.
- F. What if your fat is caused not by diet or genes, but by germs, say, a virus? It sounds like a sci-fi horror movie, but research suggests some dimension of the obesity epidemic may be attributable to infection by common viruses, says Dhurandhar. The idea of "infectobesity" came to him 20 years ago when he was a young doctor treating obesity in Bombay. He discovered that a local avian virus, SMAM-1, caused chickens to die, sickened with organ damage but also, strangely, with lots of abdominal fat. In experiments, Dhurandhar found that SMAM-1-infected chickens became obese on the same diet as uninfected ones, which stayed svelte.
- G. He later moved to the U.S. and onto a bona fide human virus, adenovirus 36 (AD-36). In the lab, every species of animal Dhurandhar infected with the virus became obese — chickens got fat, mice got fat, even rhesus monkeys at the zoo that picked up the virus from the environment suddenly gained 15 percent of their body weight upon exposure. In his latest studies, Dhurandhar has isolated a gene that, when blocked from expressing itself, seems to turn off the virus's fattening power. Stem cells extracted from fat cells and then exposed to AD-36 reliably blossom into fat

cells – but when stem cells are exposed to an AD-36 virus with the key gene inhibited, the stem cells don't differentiate. The gene appears to be necessary and sufficient to trigger AD-36-related obesity, and the goal is to use the research to create a sort of obesity vaccine.

Researchers have discovered 10 microbes so far that trigger obesity – seven of them viruses. It may be a long shot, but for people struggling desperately to be thin, even the possibility of an alternative cause of obesity offers some solace. "They feel better knowing there may be something beyond them that could be responsible," says Dhurandhar. "The thought that there could be something besides what they've heard all their lives – that they are greedy and lazy – helps."

Questions 14-18

Reading Passage 2 has five sections, A-G. Which section contains the following information? Write the correct letter, A-G, in boxes 14-18 on your answer sheet.

14. Evaluation on the effect of weight loss on different kind of diets
15. An example of research which include relatives of participants
16. Example of a group of people who never regain weight immediately after.
17. Long term hunger may appear to be acceptable to most of the participants while losing weight
18. A continuous experiment may lead to a practical application besides diet or hereditary resort.

Questions 19-23

Look at the following researchers and the list of findings below. Match each researcher with the correct finding. Write the correct letter in boxes 19-23 on your answer sheet.

List of Researchers

- A. Robert Berkowitz
- B. Rudolph Leibel
- C. Nikhil Dhurandhar
- D. Deirdre Barrett
- E. Jeffrey Friedman
- F. Teresa Hillier

19. A person's weight is predetermined to a set point by the DNA.
20. Pregnant mother who are overweight may risk their fetus
21. The aim of losing weight should be keeping healthy rather than attractiveness
22. Small changes in lifestyle will not have great impact on reducing much weight
23. Researchers should be divided into different groups with their own point of view about weight loss.

Question 24 - 37

Complete the summary below. Choose **NO MORE THAN ONE WORD** from the passage for each answer. Write your answers in boxes 24-27 on your answer sheet.

In Bombay Clinic, a young doctor who came up with the concept 'infectobesity'¹ believed that the obesity is caused by a kind of virus. Years of experiment that he conducted on 24 Later he moved to America and tested on a new virus named 25 which proved to be a significant breakthrough. Although there seems no way to eliminate the virus, a kind of 26 can be separated as to block the expressing power of the virus. The doctor is aiming at developing a new 27 to effectively combat the virus in future.

SECTION 3

GIFTED CHILDREN

- A.** BY the time Laszlo Polgar's first baby was born in 1969 he already had firm views on child-rearing. An eccentric citizen of communist Hungary, he had written a book called "Bring up Genius!" and one of his favourite sayings was "Geniuses are made, not born". An expert on the theory of chess, he proceeded to teach little Zsuzsa at home, spending up to ten hours a day on the game. Two more daughters were similarly hot-housed. All three obliged their father by becoming world-class players. The youngest, Judit, is currently ranked 13th in the world, and is by far the best female chess player of all time. Would the experiment have succeeded with a different trio of children? If any child can be turned into a star, then a lot of time and money are being wasted worldwide on trying to pick winners
- B.** America has long held "talent searches", using test results and teacher recommendations to select children for advanced school courses, summer schools and other extra tuition. This provision is set to grow. In his state-of-the-union address in 2006, President George Bush announced the "American Competitiveness Initiative" which, among much else, would train 70,000 high-school teachers to lead advanced courses for selected pupils in mathematics and science. Just as the superpowers' space race made Congress put money into science education, the thought of China and India turning out hundreds of thousands of engineers and scientists is scaring America into prodding its brightest to do their best.
- C.** The philosophy behind this talent search is that ability is innate; that it can be diagnosed with considerable accuracy; and that it is worth cultivating. In America, bright children are ranked as "moderately", "highly", "exceptionally" and "profoundly" gifted. The only chance to influence innate ability is thought to be in the womb or the first couple of years of life. Hence the fad for "teaching aids" such as videos and flashcards for newborns, and "whale sounds" on tape which a pregnant mother can strap to her belly.

- D. In Britain, there is a broadly similar belief in the existence of innate talent, but also an egalitarian sentiment which makes people queasy about the idea of investing resources in grooming intelligence. Teachers are often opposed to separate provision for the best-performing children, saying any extra help should go to stragglers. In 2002, in a bid to help the able while leaving intact the ban on most selection by ability in state schools, the government set up the National Academy for Gifted and Talented Youth. This outfit runs summer schools and master classes for children nominated by their schools. To date, though, only seven in ten secondary schools have nominated even a single child. Last year all schools were told they must supply the names of their top 10%.
- E. Picking winners is also the order of the day in ex-communist states, a hangover from the times when talented individuals were plucked from their homes and ruthlessly trained for the glory of the nation. But in many other countries, opposition to the idea of singling out talent and grooming it runs deep. In Scandinavia, a belief in virtues like modesty and social solidarity makes people flinch from the idea of treating brainy children differently.
- F. And in Japan there is a widespread belief that all children are born with the same innate abilities—and should therefore be treated alike. All are taught together, covering the same syllabus at the same rate until they finish compulsory schooling. Those who learn quickest are expected then to teach their classmates. In China, extra teaching is provided, but to a self-selected bunch. "Children's palaces" in big cities offer a huge range of after-school classes. Anyone can sign up; all that is asked is excellent attendance.
- G. Statistics give little clue as to which system is best. The performance of the most able is heavily affected by factors other than state provision. Most state education in Britain is nominally non-selective, but middle-class parents try to live near the best schools. Ambitious Japanese parents have made private, out-of-school tuition a thriving business. And Scandinavians egalitarianism might work less well in places with more diverse populations and less competent teachers. For what it's worth, the data suggest that some countries like Japan and Finland can eschew selection and still thrive. But that does not mean that any country can ditch selection and do as well.
- H. Mr Polgar thought any child could be a prodigy given the right teaching, an early start and enough practice. At one point he planned to prove it by adopting three baby boys from a poor country and trying his methods on them. (His wife vetoed the scheme.) Some say the key to success is simply hard graft. Judit, the youngest of the Polgar sisters, was the most driven, and the most successful; Zsotia, the middle one, was regarded as the most talented, but she was the only one who did not achieve the status of grand master. "Everything came easiest to her," said her older sister. "But she was lazy."

Questions 28-33

Do the following statements agree with the information given in Reading Passage 3? In boxes 28-33 on your answer sheet, write

YES	if the statement is true
NO	if the statement is false
NOT GIVEN	if the information is not given in the passage

28. America has a long history of selecting talented students into different categories.
29. Teachers and schools in Britain held welcome attitude towards government's selection of gifted students.
30. Some parents agree to move near reputable schools in Britain.
31. Middle-class parents participate in their children's education.
32. Japan and Finland comply with selected student's policy.
33. Avoiding-selection-policy only works in a specific environment.

Questions 34-35

Choose the correct letter, A, B, C or D.

Write your answers in boxes 34-35 on your answer sheet.

34. What's Laszlo Polgar's point of view towards geniuses of children?
 - A Chess is the best way to train geniuses
 - B Genius tend to happen on first child
 - C Geniuses can be educated later on
 - D Geniuses are born naturally
35. What is the purpose of citing Zsafia's example in the last paragraph?
 - A Practice makes genius
 - B Girls are not good at chess
 - C She was an adopted child
 - D Middle child is always the most talented

Questions 36-40

Use the information in the passage to match the countries (listed A-E) with correct connection below. Write the appropriate letters A-E in boxes 36-40 on your answer sheet.

A. Scandinavia

B. Japan

C. Britain

D. China

E. America

36. Less gifted children get help from other classmates

37. Attending extra teaching is open to anyone

38. People are reluctant to favor gifted children due to social characteristics

39. Both view of innate and egalitarian co-existed

40. Craze of audio and video teaching for pregnant women.

READING 39

READING PASSAGE 1

**THE DAUNTING TASK OF DESIGNING COMPUTER GAMES FOR PRESCHOOLERS BY
NINTENDO - A JAPANESE FIRM**

- A. Designing computer games for young children is a daunting task for game producers, who, for a long time, have concentrated on more "hard core" game fans. This article chronicles the design process and research involved in creating *Nintendo DS* for preschool gamers.
- B. After speaking with our producers who have a keen interest in designing for the DS, we finally agreed on three key goals for our project. First, to understand the range of physical and cognitive abilities of preschoolers in the context of handheld system game play; second, to understand how preschool gamers interact with the DS, specifically how they control the different forms of play and game mechanics offered by the games presently on the market for this platform; third, to understand the expectations of preschoolers' parents concerning the handheld systems as well as the purchase and play contexts within which game play occurs. The team of the research decided that in-home ethnographies with preschoolers and their families would yield comprehensive database with which to give our producers more information and insights, so we start by conducting 26 in-home ethnographies in three markets across the United States: an East coast urban/suburban area, a West coast urban/suburban area, and a Midwest suburban/rural area.
- C. The subjects in this study included 15 girls and 11 boys ranging from 3 years and 3 months old to 5 years and 11 months old. Also, because previous research had shown the effects of older siblings on game play (demonstrated, for example, by more advanced motor coordination when using a computer mouse), households were employed to have a combination of preschoolers with and without elder peers. In order to understand both "experienced" and "new" preschool users of the platform, we divided the sample so that 13 families owned at least one Nintendo DS and the others did not. For those households that did not own a DS, one was brought to the interview for the kid to play. This allowed us to see both the instinctive and intuitive movements of the new players (and of the more experienced players when playing new games), as well as the learned movements of the more experienced players. Each of those interviews took about 60 to 120 minutes and included the preschooler, at least one parent, and often siblings and another caregiver.
- D. Three kinds of information were collected after each interview. From any older siblings and the parents that were available, we gathered data about the buying decisions surrounding game systems in the household, the family's typical game play patterns, levels of parental moderation with regard to computer gaming, and the most favorite games played by family members. We could also understand the ideology of gaming in these homes because of these in-home interviews: what types of spaces were used for game play, how the systems were installed, where the handheld play occurred in the house (as well as on-the-go play), and the number and type of games and game systems owned. The most important is, we gathered the game-playing information for every single kid.

- E. Before carrying out the interviews, the research team had closely discussed with the in-house game producers to create a list of game mechanics and problems tied to preschoolers' motor and cognitive capabilities that were critical for them to understand prior to writing the games. These ranged from general dexterity issues related to game controllers to the effectiveness of in-game instructions to specific mechanics in current games that the producers were interested in implementing for future preschool titles. During the interviews, the moderator gave specific guidance to the preschooler through a series of games, so that he or she could observe the interaction and probe both the preschooler and his or her parents on feelings, attitudes, and frustrations that arose in the different circumstances.
- F. If the subject in the experiment had previous exposure to the DS system, he or she was first asked to play his or her favorite game on that machine. This gave the researchers information about current of gaming skill related to the complexity of the chosen one, allowing them to see the child playing a game with mechanics he or she was already familiar with. Across the 26 preschoolers, the Nintendo DS selections scope were very broad including New Super Mario Bros, Sonic Rush, Nintendo, and Tony Hawk's Proving Ground. The interviewer observed the child play, noting preferences for game mechanics and motor interactions with the device as well as the complexity level each game mechanic was for the tested subject. The researchers asked all of the preschoolers to play with a specific game in consultation with our producers, The Little Mermaid: Ariel's Undersea Adventure. The game was chosen for two major reasons. First, it was one of the few games on the market with characters that appeal to this young age group. Second, it incorporated a large variety of mechanics that highlighted the uniqueness of the DS platform, including using the microphone for blowing or singing.
- G. The findings from this initial experiment were extensive. After reviewing the outcomes and discussing the implications for the game design with our internal game production team, we then outlined the designing needs and presented the findings to a firm specialising in game design. We worked closely with those experts to set the game design for the two preschool-targeted DS games under development on what we had gathered.
- H. As the two DS games went into the development process, a formative research course of action was set up. Whenever we developed new game mechanics, we brought preschoolers into our in-house utility lab to test the mechanics and to evaluate both their simplicity, and whether they were engaging. We tested either alpha or beta versions of different elements of the game, in addition to looking at overarching game structure. Once a full version of the DS game was ready, we went back into the field test with a dozen preschoolers and their parents to make sure that each of the game elements worked for the children, and that the overall objective of the game was understandable and the process was enjoyable for players. We also collected parents' feedback on whether they thought the game is appropriate, engaging, and worth the purchase.

Questions 1-5

Complete the sentences below. Choose **ONE WORD ONLY** from the passage for each answer.

Exploratory Research Project

Main Objectives:

Determine the relevant 1..... in the context

Observe how preschoolers manage playing

Investigate attitudes of 2..... towards games

Subjects:

26 children from different US 3.....

Age range: 3 years and 3 months to 5 years and 11 months

Some children have older 4..... in the house as playing peers.

Equal number of new and 5..... players

Some households have Nintendo DS and some don't

Length of Interview:

1-2 hours

Questions 6-9

TRUE if the statement agrees with the information

FALSE if the statement contradicts the information

NOT GIVEN if there is no information on this

6. One area of research is how far mothers and fathers controlled children's playing after school.

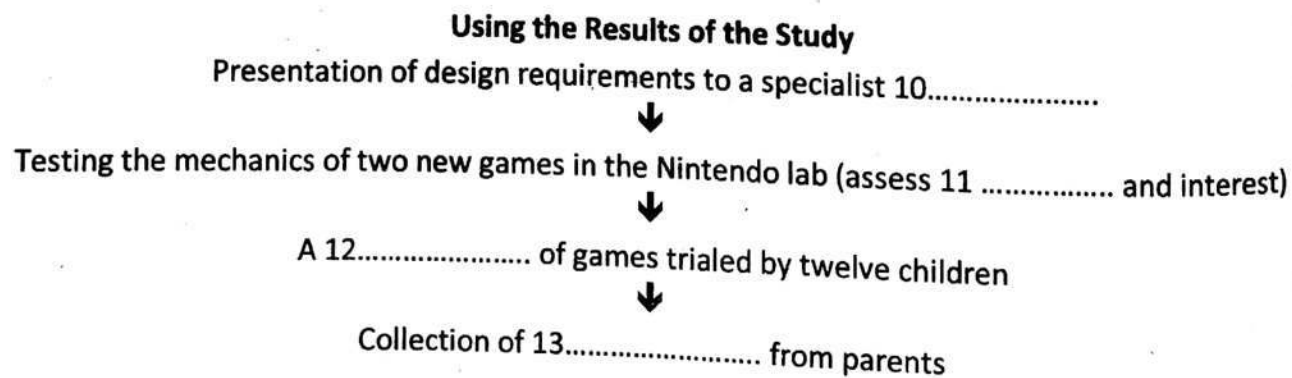
7. Some researchers are allowed an access to the subjects' houses.

8. The researchers regarded The Little Mermaid: Ariel's Undersea Adventure as likely to appeal to preschoolers.

9. The Little Mermaid: Ariel's Undersea Adventure is entirely designed by hand controls.

Questions 10-13

Complete the flow-chart below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer



SECTION 2

THE STORY OF THE PENCIL

- A. The beginning of the story of pencils started with a lightning. Graphite, the main material for producing pencil, was discovered in 1564 in Borrowdale in England when a lightning struck a local tree during a thunder. Local people found out that the black substance spotted at the root of the unlucky tree was different from burning ash of wood. It was soft, thus left marks everywhere. Chemistry was barely out of its infancy at the time, so people mistook it for lead, equally black but much heavier. It was soon put to use by locals in marking their sheep for signs of ownership and calculation.
- B. Britain turns out to be the major country where mines of graphite can be detected and developed. Even so, the first pencil was invented elsewhere. As graphite is soft, it requires some form of encasement. In Italy, graphite sticks were initially wrapped in string or sheepskin for stability, becoming perhaps the very first pencil in the world. Then around 1560, an Italian couple made what are likely the first blueprints for the modern, wood-encased carpentry pencil. Their version was a flat, oval, more compact type of pencil. Their concept involved the hollowing out of a stick of juniper wood. Shortly thereafter in 1662, a superior technique was discovered by German people: two wooden halves were carved, a graphite stick inserted, and the halves then glued together – essentially the same method in use to this day. The news of usefulness of these early pencils spread far and wide, attracting the attention of artists all over the known world.
- C. Although graphite core in pencils is still referred to as lead, modern pencils do not contain lead as the “lead” of the pencil is actually a mix of finely ground graphite and clay powders. This mixture is important because the amount of clay content added to the graphite depends on intended pencil hardness, and the amount of time spent on grinding the mixture determines the quality of the lead. The more clay you put in, the higher hardness the core has. Many pencils across the world, and almost all in Europe, are graded on the European system. This system of naming used B for black and H for hard; a pencil’s grade was described by a sequence or successive Hs or Bs such as BB and BBB for successively softer leads, and HH and HHH for successively harder ones. Then the standard writing pencil is graded HB.
- D. In England, pencils continued to be made from whole sawn graphite. But with the mass production of pencils, they are getting drastically more popular in many countries with each passing decade. As demands rise, appetite for graphite soars. According to the United States Geological Survey (USGS), world production of natural graphite in 2012 was 1,100,000 tonnes, of which the following major exporters are: China, India, Brazil, North Korea and Canada. However, much in contrast with its intellectual application in producing pencils, graphite was also widely used in the military. During the reign of Elizabeth 1, Borrowdale graphite was used as a refractory material to line moulds for cannonballs, resulting in rounder, smoother balls that could be fired farther, contributing to the strength of the English navy. This particular deposit of graphite was extremely pure and soft, and could easily be broken into sticks. Because of its military importance, this unique mine and its production were strictly controlled by the Crown.
- E. That the United States did not use pencils in the outer space till they spent \$1000 to make a pencil to use in zero gravity conditions is in fact a fiction. It is widely known that astronauts in Russia

used grease pencils, which don't have breakage problems. But it is also a fact that their counterparts in the United States used pencils in the outer space before real zero gravity pencil was invented. They preferred mechanical pencils, which produced fine lines, much clearer than the smudgy lines left by the grease pencils that Russians favoured. But the lead tips of these mechanical pencils broke often. That bit of graphite floating around the space capsule could get into someone's eye, or even find its way into machinery or electronics short or other problems. But despite the fact that the Americans did invent zero gravity pencil later, they stuck to mechanical pencils for many years.

- F. Against the backdrop of a digitalized world, the prospect of pencils seems bleak. In reality, it does not. The application of pencils has by now become so widespread that they can be seen everywhere, such as classrooms, meeting rooms and art rooms, etc. A spectrum of users are likely to continue to use it into the future: students to do math works, artists to draw on sketch pads, waiters or waitresses to mark on order boards, make-up professionals to apply to faces, and architects to produce blue prints. The possibilities seem limitless

Questions 14-20

Complete the sentences below. Choose **ONE WORD ONLY** from the passage for each answer. Write your answers in boxes 14-20 on your answer sheet

Graphite was found under a 14..... in Borrowdale. It was dirty to use because it was 15.....

Ancient people used graphite to sign 16

People found graphite 17..... in Britain.

The first pencil was graphite wrapped in 18 or animal skin.

Since graphite was too smooth, 19..... was added to make it harder.

Russian astronauts preferred 20..... pencils to write in the outer space.

Questions 21-26

Do the following statements agree with the information given in Reading Passage 2? In boxes 20-26 on your answer sheet write

- TRUE:** if the statement agrees with the information
FALSE: if the statement contradicts the information
NOT GIVEN: if there is no information on this

21. Italy is probably the first country of the whole world to make pencils.
22. Germany used various kinds of wood to make pencils.
23. Graphite makes a pencil harder and sharper.
24. In Britain, pencils are not produced anymore.
25. American astronauts did not use pencils in outer space.
26. Pencils are unlikely to be used in the future.

SECTION 3

WHAT MOTIVATES EMPLOYEES

Scientists have been researching the way to get employees motivated for many years. This research is a relational study which builds the fundamental and comprehensive model for study. This is especially true when the business goal is to turn unmotivated teams into productive ones. But their researchers have limitations. It is like studying the movements of car without taking out the engine.

Motivation is what drives people to succeed and plays a vital role in enhancing an organizational development. It is important to study the motivation of employees because it is related to the emotion and behavior of employees. Recent studies show there are four drives for motivation. They are the drive to acquire, the drive to bond, the drive to comprehend and the drive to defend.

The Drive to Acquire

The drive to acquire must be met to optimize the acquire aspect as well as the achievement element. Thus the way that outstanding performance is recognized, is through the type of perks that are provided to polish the career path. But sometimes a written letter of appreciation generates more motivation than a thousand dollar check, which can serve as the invisible power to boost business engagement. Successful organizations and leaders not only need to focus on the optimization of physical reward but also on moving other levers within the organization that can drive motivation.

The Drive to Bond

The drive to bond is also key to driving motivation. There are many kinds of bonds between people, like friendship, family. In a company, employees also want to be an essential part of the company. They want to belong to the company. Employees will be motivated if they find personal belonging to the company. In the meantime, the employee will achieve the most commitment on condition that the force of motivation within the employee affects the direction, intensity and persistence of decision and behavior in company.

The Drive to Comprehend

The drive to comprehend motivates many employees to higher performance. For years, it has been known that setting stretch goals can greatly impact performance. Organizations need to ensure that the various job roles provide employees with stimulation that challenges them or allows them to grow. Employees don't want to do meaningless things or monotonous jobs. If the job didn't provide them with personal meaning and fulfillment, they will leave the company.

The Drive to Defend

The drive to defend is often the hardest lever to pull. The drive manifests itself as a quest to create and promote justice, fairness, and the ability to express ourselves freely. The organizational lever

for this basic human motivator is resource allocation. This drive is also met through an employee feeling connection to a company. If their companies are merged with another, they show worries. Two studies have been done to find the relations between the four drives and motivation. The article based on two studies was finally published in Harvard Business Review. Most authors' arguments have laid emphasis on four-drive theory and actual investigations. Using the results of the surveys which executed with employees from Fortune 500 companies and other two global businesses (P company and H company), the article mentions about how independent drives influence the employees' behavior and how organizational levers boost employee motivation. The studies show that the drive to bond is most related to fulfilling commitment, while the drive to comprehend is most related to how much effort the employees spend on works. The drive to acquire can be satisfied by a rewarding system which ties rewards to performance, and gives the best people opportunities for advancement. For drive to defend, a study on the merging of P company and H company shows that employees in former company show an unusual cooperating attitude.

The key to successfully motivate employees is to meet all drives. Each of these drives is important if we are to understand employee motivation. These four drives, while not necessarily the only human drives, are the ones that are central to the unified

Questions 27-31

Choose the correct letter A, B, C or D.

Write the correct letter in boxes 27-31 on your answer sheet.

27. According to the passage, what are we told about the study of motivation?
- A. The theory of motivating employees is starting to catch attention in organizations in recent years.
 - B. It is very important for managers to know how to motivate their subordinates because it is related to the salary of employees.
 - C. Researchers have tended to be too theoretical to their study.
 - D. The goal of employee motivation is to increase the profit of organizations.
28. What can be inferred from the passage about the study of people's drives?
- A. Satisfying employees' drives can positively lead to the change the behavior.
 - B. Satisfying employees' drives will negatively affect their emotions.
 - C. Satisfying employees' drives can increase companies' production.
 - D. Satisfying employees' drives will result in employees' outstanding performance.
29. According to paragraph three, in order to optimize employees' performance, _____ are needed.
- A. drive to acquire and achievement element
 - B. outstanding performance and recognition
 - C. career fulfillment and a thousand-dollar check
 - D. financial incentive and recognition
30. According to paragraph five, how does "the drive to comprehend" help employees perform better?
- A. It can help employees better understand the development of their organisations.
 - B. It can help employees feel their task is meaningful to their companies.
 - C. It can help employees set higher goals.
 - D. It can provide employees with repetitive tasks.
31. According to the paragraph six, which of the following is true about "drive to defend"?
- A. Organisational resource is the most difficult to allocate.
 - B. It is more difficult to implement than the drive to comprehend.
 - C. Employees think it is very important to voice their opinions.
 - D. Employees think it is very important to connect with a merged corporation.

Questions 32-34

Choose **THREE** letters, A-F

Write the correct letters in boxes 32-34 on your answer sheet

Which **THREE** of the following statements are true of the study of drives?

- A. Employees will be motivated if they feel belonged to the company.
- B. If employees get an opportunity of training and development program, their motivation will be enhanced.
- C. If employees' working goals are complied with organizational objectives, their motivation will be reinforced.
- D. If employees' motivation is very low, companies should find a way to increase their salary as their first priority.
- E. If employees find their work lacking challenge, they will leave the company.
- F. Employees will worry of their company is sold.

Questions 35-40

Do the following statements agree with the claims of the writer in Reading Passage 3?

In boxes 35-40 on your answer sheet, write

- | | |
|------------------|--|
| YES | if the statement agrees with the claims of the writer |
| NO | if the statement contradicts the claims of the writer |
| NOT GIVEN | if it is impossible to say what the writer thinks about it |

- 35. Increasing pay can lead to high work motivation.
- 36. Local companies benefit more from global companies through the study.
- 37. Employees achieve the most commitment if their drive to comprehend is met.
- 38. The employees in former company presented unusual attitude toward the merging of two companies.
- 39. The two studies are done to analyze the relationship between the natural drives and the attitude of the employees.
- 40. Rewarding system cause the company to lose profit.

READING 40

READING PASSAGE 1

THE EVOLUTION OF REFRIGERATION

Refrigeration is a process of removing heat, which means cooling an area or a substance below the environmental temperature. Mechanical refrigeration makes use of the evaporation of a liquid refrigerant, which goes through a cycle so that it can be reused. The main cycles include vapour-compression, absorption steam-jet or steam-ejector, and airing. The term 'refrigerator' was first introduced by a Maryland farmer, Thomas Moore, in 1803, but it is in the 20th century that the appliance we know today first appeared.

People used to find various ways to preserve their food before the advent of mechanical refrigeration systems. Some preferred using cooling systems of ice or snow, which meant that diets would have consisted of very little fresh food or fruits and vegetables, but mostly of bread, cheese and salted meals. For milk and cheeses, it was very difficult to keep them fresh, so such foods were usually stored in a cellar or window box. In spite of those measures, they could not survive rapid spoilage. Later on, people discovered that adding such chemical as sodium nitrate or potassium nitrate to water could lead to a lower temperature. In 1550 when this technique was first recorded, people used it to cool wine, as was the term 'to refrigerate'. Cooling drinks grew very popular in Europe by 1600, particularly in Spain, France, and Italy. Instead of cooling water at night, people used a new technique: rotating long-necked bottles of water which held dissolved saltpeter. The solution was intended to create very low temperatures and even to make ice. By the end of the 17th century, iced drink including frozen juices and liquors had become extremely fashionable in France.

People's demand for ice soon became strong. Consumers' soaring requirement for fresh food, especially for green vegetables, resulted in reform in people's dieting habits between 1830 and the American Civil War, accelerated by a drastic expansion of the urban areas and the rapid amelioration in an economy of the populace. With the growth of the cities and towns, the distance between the consumer and the source of food was enlarged. In 1799, as a commercial product, ice was first transported out of Canal Street in New York City to Charleston, South Carolina. Unfortunately, this transportation was not successful because when the ship reached the destination, little ice left. Frederick Tudor and Nathaniel Wyeth, two New England' businessmen, grasped the great potential opportunities for ice business and managed to improve the storage method of ice in the process of shipment. The acknowledged 'Ice King' in that time, Tudor concentrated his efforts on bringing the ice to the tropical areas. In order to achieve his goal and guarantee the ice to arrive at the destination safely he tried many insulating materials in an experiment and successfully constructed the ice containers, which reduce the ice loss from 66 per cent to less than 8 per cent at drastically. Wyeth invented an economical and speedy method to cut the ice into uniform blocks, which had a tremendous positive influence on the ice industry. Also, he improved the processing techniques for storing, transporting and distributing ice with less waste.

When people realised that the ice transported from the distance was not as clean as previously thought and gradually caused many health problems, it was more demanding to seek the clean natural sources of ice. To make it worse, by the 1890s water pollution and sewage dumping made

clean ice even more unavailable. The adverse effect first appeared in the blowing industry, and then seriously spread to such sectors as meat packing and dairy industries. As a result, the clean, mechanical refrigeration was considerably in need.

Many inventors with creative ideas took part in the process of inventing refrigeration, and each version was built on the previous discoveries. Dr William Cullen initiated to study the evaporation of liquid under the vacuum conditions in 1720. He soon invented the first man-made refrigerator at the University of Glasgow in 1748 with the employment of ethyl ether boiling into a partial vacuum. American inventor Oliver Evans designed the refrigerator firstly using vapour rather than liquid in 1805. Although his conception was not put into practice in the end the mechanism was adopted by an American physician John Gorrie, who made one cooling machine similar to Evans' in 1842 with the purpose of reducing the temperature of the patient with yellow fever in a Florida hospital. Until 1851, Evans obtained the first patent for mechanical refrigeration in the USA. In 1820, Michael Faraday, a Londoner, first liquefied ammonia to cause cooling. In 1859, Ferdinand Carre from France invented the first version of the ammonia water cooling machine. In 1873, Carl von Linde designed the first practical and portable compressor refrigerator in Munich, and in 1876 he abandoned the methyl ether system and began using ammonia cycle. Linde later created a new method ('Linde technique') for liquefying large amounts of air in 1894. Nearly a decade later, this mechanical refrigerating method was adopted subsequently by the meat packing industry in Chicago.

Since 1840, cars with the refrigerating system had been utilised to deliver and distribute milk and butter. Until 1860, most seafood and dairy products were transported with cold-chain logistics. In 1867, refrigerated, railroad cars were patented to J.B. Sutherland from Detroit, Michigan, who invented insulated cars by installing the ice bunkers at the end of the cars: air came in from the top, passed through the bunkers, circulated through the cars by gravity and controlled by different quantities of hanging flaps which caused different air temperatures. Depending on the cargo (such as meat, fruits etc.) transported by the cars, different car designs came into existence. In 1867, the first refrigerated car to carry fresh fruit was manufactured by Parker Earle of Illinois, who shipped strawberries on the Illinois Central Railroad. Each chest was freighted with 100 pounds of ice and 200 quarts of strawberries. Until 1949, the trucking industry began to be equipped with the refrigeration system with a roof-mounted cooling device, invented by Fred Jones.

From the late 1800s to 1929, the refrigerators employed toxic gases - methyl chloride, ammonia, and sulfur dioxide - as refrigerants. But in the 1920s, a great number of lethal accidents took place due to the leakage of methyl chloride out of refrigerators. Therefore, some American companies started to seek some secure methods of refrigeration. Frigidaire detected a new class of synthetic, refrigerants called halocarbons or CFCs (chlorofluorocarbons) in 1928. This research led to the discovery of chlorofluorocarbons (Freon), which quickly became the prevailing material in compressor refrigerators. Freon was safer for the people in the vicinity, but in 1973 it was discovered to have detrimental effects on the ozone layer. After that, new improvements were made, and Hydrofluorocarbons, with no known harmful effects, was used in the cooling system. Simultaneously, nowadays, Chlorofluorocarbons (CFCs) are no longer used; they are announced illegal in several places, making the refrigeration far safer than before.

Questions 1-5

Look at the following events and the list of dates below. Match each event with the correct date A to F. Write the correct letter A-F in boxes 1-5 on your answer sheet

1. Vehicles with refrigerator were used to transport on the road.
2. Ice was sold around the United States for the first time
3. Some kind of chemical refrigerant was found harmful to the atmosphere
4. The term refrigerator was firstly introduced
5. Some chemicals were added to refrigerate wine

List of dates

- A. 1550
- B. 1799
- C. 1803
- D. 1840
- E. 1949
- F. 1973

Question 6 to 10

Looking the following opinions or deeds and the list of people below. Match each opinion or deed with the correct person A-G. Write the correct letter A to G in boxes 6 to 10 on your answer sheet

List of people

- A. Thomas Moore
 - B. Frederick Tudor
 - C. Carl Von Linde
 - D. Nathaniel and Wyeth
 - E. JB Sutherland
 - F. Fred Jones
 - G. Parker Earle
6. Patented the idea that refrigerating systems can be installed on tramcars
 7. Invented an ice cutting technology that could save money and time
 8. Enabling the cold storage technology to be applied in fruit
 9. Invented a cooling device applied into the trucking industry
 10. Created a new technique to liquefy the air

Question 11 to 14

Complete each sentence with the correct ending A-E below. Write the correct letter A to E in boxes 11 to 14 on your answer sheet

11. A healthy change between 1830 and American Civil War was greatly associated with
12. The development of urbanisation was likely to cause
13. Problems due to water treatment contributed to
14. The risk of environmental devastation from the refrigeration lead to

- A. New developments such as application of Hydrofluorocarbons
- B. Consumers demand for fresh food especially for vegetables
- C. The discovery of chlorofluorocarbons (freon)
- D. Regional transportation system for refrigeration for long-distance
- E. Extensive spread of the refrigeration method

READING PASSAGE 2

SAHARA AND ITS ANCIENT PEOPLE

On Oct. 13, 2000, Paul Sereno, a professor from the University of Chicago, guided a team of palaeontologists to climb out of three broken Land Rovers, contented their water bottles and walked across the toffee-coloured desert called Tenere Desert. Tenere, one of the most barren areas on the Earth, is located on the southern flank of Sahara. According to the turbaned nomads Tuareg who have ruled this infertile domain for a few centuries, this California-size ocean of sand and rock is a 'desert within a desert'. In the Tenere Desert, massive dunes might stretch a hundred miles, as far as the eyes can reach. In addition, 120-degree heat waves and inexorable winds can take almost all the water from a human body in less than a day.

Mike Hettwer, a photographer in the team, was attracted by the amazing scenes and walked to several dunes to take photos of the amazing landscape. When reaching the first slope of the dune, he was shocked by the fact that the dunes were scattered with many bones. He photographed these bones with his digital camera and went to the Land Rover in a hurry. 'I found some bones,' Hettwer said to other group members, 'to my great surprise, they do not belong to the dinosaurs. They are human bones.'

One day in the spring of 2005, Paul Sereno got in touch with Elena Garcea, a prestigious archaeologist at the University of Cassino in Italy, asking her to return to the site with him together. After spending 30 years in researching the history of Nile in Sudan and of the mountains in the Libyan Desert, Garcea got well acquainted with the life of the ancient people in Sahara. But she did not know Sereno before this exploration, whose claim of having found so many skeletons in Tenere desert was unreliable to some archaeologists, among whom one person considered Sereno just as a 'moonlighting palaeontologist'. However, Garcea was so obsessive with his perspective as to accept his invitation willingly.

In the following three weeks, Sereno and Garcea (along with five excavators, five Tuareg guides, and five soldiers from Niger's army) sketched a detailed map of the destined site, which was dubbed Gobero after the Tuareg name for the area, a place the ancient Kiffian and Tuareg nomads used to roam. After that, they excavated eight tombs and found twenty pieces of artefacts for the above mentioned two civilisations. From these artefacts, it is evidently seen that Kiffian fishermen caught not only the small fish, but also some huge ones: the remains of Nile perch, a fierce fish weighing about 300 pounds, along with those of the alligators and hippos, were left in the vicinity of dunes.

Sereno went back with some essential bones and artefacts, and planned for the next trip to the Sahara area. Meanwhile, he pulled out the teeth of skeletons carefully and sent them to a researching laboratory for radiocarbon dating. The results indicated that while the smaller 'sleeping' bones might date back to 6,000 years ago (well within the Tenerian period), the bigger compactly tied artefacts were approximately 9,000 years old, just in the heyday of Kiffian era. The scientists now can distinguish one culture from the other.

In the fall of 2006, for the purpose of exhuming another 80 burials, these people had another trip to Gobero, taking more crew members and six extra scientists specialising in different areas. Even

at the site, Chris Stojanowski, bio-archaeologist in Arizona State University, found some clues by matching the pieces. Judged from the bones, the Kiffian could be a people of peace and hardworking. 'No injuries in heads or forearms indicate that they did not fight too much,' he said. 'And they had strong bodies.' He pointed at a long narrow femur and continued, 'From this muscle attachment, we could infer the huge leg muscles, which means this individual lived a strenuous lifestyle and ate much protein. Both of these two inferences coincide with the lifestyle of the people living on fishing.' To create a striking contrast, he displayed a femur of a Tenerian male. This ridge was scarcely seen. 'This individual had a less laborious lifestyle, which you might expect of the herder.'

Stojanowski concluded that the Tenerian were herders, which was consistent with the other scholars' dominant view of the lifestyle in Sahara area 6,000 years ago, when the dry climate favoured herding rather than hunting. But Sereno proposed some confusing points: if the Tenerian was herders, where were the herds? Despite thousands of animal bones excavated in Gobero, only three cow skeletons were found, and none of goats or sheep found. 'It is common for the herding people not to kill the cattle, particularly in a cemetery,' Elena Garcea remarked, 'Even the modern pastoralists such as Niger's Wodaabe are reluctant to slaughter the animals in their herd.' Sereno suggested, 'Perhaps the Tenerian in Gobero were a transitional group that had still relied greatly on hunting and fishing and not adopted herding completely.'

Questions 15 to 18

Do the following statement agree with the information given in reading passage 2. In boxes 15 to 18 on your answer sheet write

- TRUE** if the statement agrees with the information
FALSE if the statement contradicts the information
NOT GIVEN if there is no information on this

15. The pictures of rock engravings found in green Sahara is similar to those in other places
16. Tenere desert was quite a fertile area in Sahara desert
17. Hettwer found human remains in the desert by chance
18. Sereno and Garcea have cooperated in some archaeological activities before studying ancient Sahara people

Questions 19 to 21

Answer the questions below. Choose no more than three words and/or a number from the passage for each answer. Write your answers in boxes 19 to 20 on your answer sheet.

19. What did Sereno and Garcea produce in the initial weeks before digging work?
20. What did Sereno send to the research center?
21. How old were the bigger tightly bundled burials having been identified estimated to be?

Question 22-27

Complete the notes below. Choose one word only from the passage for each answer. Write your answers in boxes 22-27 on your answer sheet.

The Kiffian

- they seemed to be peaceful and industrious since the researcher did not find 22..... on their heads and forearms
- their lifestyle was 23.....
- through the observation on the huge leg muscles, it could be inferred that their diet had plenty of 24.....

The Tenerian

- Stojanowski presumed that the Tenerian preferred herding to 25.....
- But only the bones of individual animals such as 26..... were found
- Sereno supposed the Tenerian in Gobero lived in a 27..... group at that time.

READING PASSAGE 3

Questions 28-32

Reading passage 3 has seven paragraphs, **A-G**. Choose the correct heading for paragraphs **A-G** from the list of headings below. Write the correct number, **i-ix**, in boxes 28-32.

List of Headings

- i. An application of short codes on the TV screen
- ii. An overview of a fast-growing business
- iii. The trend that profitable games are gaining more concerns
- iv. Why Netherlands takes a leading role
- v. A new perspective towards sharing the business opportunities
- vi. Factors relevant to the rapid increase in interactive TV
- vii. The revenue gains and bonus share
- viii. The possibility of the complex technology replaced by the simple ones
- ix. The mind change of set-top box providers

Example: Section A:

Answer ii

28. Section B

29. Section C

30. Section D

31. Section E

Example: Section F:

Answer ix

32. Section G

INTERACTIVE TELEVISION

- A. Once upon a time, if a television show with any self-respect wanted to target a young audience, it needed to have an e-mail address. However, in Europe's TV shows, such addresses are gradually substituted by telephone numbers so that audiences can text the show from their mobile phones. Therefore, it comes as no shock that according to Gartner's research, texting has recently surpassed Internet usage across Europe. Besides, among the many uses of text messaging, one of the fastest-growing uses is to interact with television. The statistics provided by Gartner can display that 20% of French teenagers, 11% in Britain and 9% in Germany have responded to TV programmes by sending a text message.
- B. This phenomenon can be largely attributed to the rapid growth of reality TV shows such as 'Big Brother', where viewers get to decide the result through voting. The majority of reality shows are now open to text-message voting, and in some shows like the latest series of Norway's 'Big Brother', most votes are collected in this manner. But TV-texting isn't just about voting. News shows encourage viewers to comment by texting messages; game shows enable the audience to be part of the competition; music shows answer requests by taking text messages; and broadcasters set up on-screen chatrooms. TV audiences tend to sit on the sofa with their mobile phones right by their sides, and 'it's a supernatural way to interact,' says Adam Daum of Gartner.
- C. Mobile service providers charge appreciable rates for messages to certain numbers, which is why TV-texting can bring in a lot of cash. Take the latest British series of 'Big Brother' as an example. It brought about 5.4m text-message votes and £1.35m (\$2.1m) of profit. In Germany, MTV's 'Videoclash' encourages the audience to vote for one of two rival videos, and induces up to 40,000 texts per hour, and each one of those texts costs €0.30 (\$0.29), according to a consultancy based in Amsterdam. The Belgian quiz show '1 Against 100' had an eight-round texting match on the side, which brought in 110,000 participants in one month, and each of them paid €0.50 for each question. In Spain, a cryptic-crossword clue invites the audience to send their answers through text at the expense of €1, so that they can be enrolled in the poll to win a €300 prize. Normally, 6,000 viewers would participate within one day.

At the moment, TV-related text messaging takes up a considerable proportion of mobile service providers' data revenues. In July, Mm02 (a British operator) reported an unexpectedly satisfactory result, which could be attributed to the massive text waves created by 'Big Brother'. Providers usually own 40%-50% of the profits from each text, and the rest is divided among the broadcaster, the programme producer and the company which supplies the message-processing technology. So far, revenues generated from text messages have been an indispensable part of the business model for various shows. Obviously, there has been grumbling that the providers take too much of the share. Endemol, the Netherlands-based production firm that is responsible for many reality TV shows including 'Big Brother', has begun constructing its own database for mobile-phone users. It plans to set up a direct billing system with the users and bypass the

providers.

- D. How come the joining forces of television and text message turn out to be this successful? One crucial aspect is the emergence of one-of-a-kind four-, five- or six-digit numbers known as 'short codes'. Every provider has control over its own short codes, but not until recently have they come to realise that it would make much more sense to work together to offer short codes compatible with all networks. The emergence of this universal short codes was a game-changer, because short codes are much easier to remember on the screen, according to Lars Becker of Flytxt, a mobile-marketing company.
- E. Operators' co-operation on enlarging the market is by a larger trend, observes Katrina Bond of Analysys, a consultancy. When challenged by the dilemma between holding on tight to their margins and permitting the emergence of a new medium, no provider has ever chosen the latter WAP, a technology for mobile-phone users to read cut-down web pages on their screens, failed because of service providers' reluctance towards revenue sharing with content providers. Now that they've learnt their lesson, they are altering the way of operating. Orange, a French operator, has come such a long way as to launch a rate card for sharing revenue of text messages, a new level of transparency that used to be unimaginable.
- F. At a recent conference, Han Weegink of CMG, a company that offers the television market text-message infrastructure, pointed out that the television industry is changing in a subtle yet fundamental way. Instead of the traditional one-way presentation, more and more TV shows are now getting viewers' reactions involved.

Certainly, engaging the audiences more has always been the promise of interactive TV. An interactive TV was originally designed to work with exquisite set-top devices, which could be directly plugged into the TV. However, as Mr Daum points out, that method was flawed in many ways. Developing and testing software for multiple and incompatible types of set-top box could be costly, not to mention that the 40% (or lower) market penetration is below that of mobile phones (around 85%). What's more, it's quicker to develop and set up apps for mobile phones. 'You can approach the market quicker, and you don't have to go through as many greedy middlemen,' Mr Daum says. Providers of set-top box technology are now adding texting function to the design of their products.

- G. The triumph of TV-related texting reminds everyone in the business of how easily a fancy technology can all of a sudden be replaced by a less complicated, lower-tech method. That being said, the old-fashioned approach to interactive TV is not necessarily over; at least it proves that strong demands for interactive services still exist. It appears that the viewers would sincerely like to do more than simply staring at the TV screen. After all, couch potatoes would love some thumb exercises.

Questions 33- 35

Choose the correct letter A, B, C or D. Write the correct letter in boxes 33-35 in your answer sheet.

33. In Europe, a research suggests that young audiences spend more money on

- A. Thumbing text messages
- B. Writing emails
- C. Watching TV programs
- D. Talking through mobile phones

34. What would happen when reality TV shows invite the audience to vote?

- A. Viewers would get attractive bonus
- B. They would be part of the competition
- C. Their questions would be replied
- D. Their participation could change the result

35. interactive TV will change from concentrating on set-top devices to

- A. increasing their share in the market
- B. Setting up a modified set-top box
- C. Building an embedded message platform
- D. Marching into the European market

Questions 36 to 40

Look at the following descriptions on the list of companies below. Match each description with the correct company A-F

Write your answers in boxes 36 to 40 on your answer sheet

List of companies

- A. Flytxt
- B. Analysys
- C. Endemol
- D. CMG
- E. MmO₂
- F. Gartner

36. Offered mobile phone message technology

37. Earned considerable amount of money through a famous program

38. Expressed the view that short codes are convenient to remember when turning up

39. Built their own mobile phone operating applications

40. Indicated that it is easy for people to send message in an interactive TV

READING 21 ANSWERS

1. VIII
2. II
3. VI
4. V
5. I
6. X
7. III
8. NO
9. NO
10. YES
11. NOT GIVEN
12. NOT GIVEN
13. YES
14. B
15. D
16. E
17. H
18. WIND/WINDS
19. SWAYING
20. FURTHER APART
21. FOOTSTEPS
22. HORIZONTAL FORCES
23. UPRIGHT
24. ARUP
25. IMPERIAL COLLEGE
26. UNIVERSITY OF SOUTHAMPTON
27. C
28. C
29. D
30. A
31. E
32. B
33. YES
34. YES
35. NO
36. NO
37. NOT GIVEN
38. NO
39. NOT GIVEN
40. YES

READING 22 ANSWERS

1. NESTS
2. TORTOISES
3. OAKS
4. NATIVE AMERICANS
5. PRESCRIBED BURNS
6. SHRUBS
7. SOIL
8. ANTS
9. EGGS
10. TRUE
11. FALSE
12. NOT GIVEN
13. TRUE
14. D
15. G
16. A
17. B
18. H
19. B
20. B
21. C
22. A
23. POETICS
24. TRAGEDY
25. LANDMARKS
26. FLAW/WEAKNESS
27. IV
28. X
29. III
30. VII
31. I
32. V
33. IX
34. LINEAR
35. OBSTACKLE
36. ACOUSTIC
37. BARCHAN
38. SHAPE
39. TONE
40. MINERALS

READING 23 ANSWERS

1. TRUE
2. NOT GIVEN
3. FALSE
4. FALSE
5. TRUE
6. TRUE
7. NOT GIVEN
8. TOOLS
9. NOMADIC
10. GROUPED (TOGETHER)
11. FOODSTUFFS
12. 20,000
13. CRAFT SPECIALISTS
14. BLACK STRIPES
15. 12 MILLION
16. AUSTRALIA
17. EUROPEAN
18. A
19. D
20. C
21. B
22. A
23. D
24. B
25. D
26. A
27. V
28. IX
29. I
30. VI
31. X
32. VIII
33. C
34. B
35. D
36. D
37. A
38. HORACE WALPOLE
39. FAIRY TALE
40. SRI LANKA

READING 24 ANSWERS

1. B
2. A
3. B
4. F
5. C
6. E
7. G
8. G
9. A
10. SWIMMING SPEED
11. SEA WATER/SALT WATER/SALT
12. COASTAL OTTERS
13. RABBITS, MOLES
14. III
15. VI
16. I
17. II
18. IX
19. V
20. IV
21. YELLOW-FEVER EPIDEMIC
22. FINLAND
23. INSTITUTIONS/GOVERNMENTS
24. EUROPE
25. EINKORN WHEAT
26. SINGAPORE
27. B
28. C
29. A
30. A
31. YES
32. NOT GIVEN
33. NO
34. NOT GIVEN
35. YES
36. NO
37. F
38. B
39. A
40. D

READING 25 ANSWERS

1. X
2. XI
3. III
4. I
5. VI
6. V
7. IX
8. VII
9. FALSE
10. TRUE
11. TRUE
12. NOT GIVEN
13. NOT GIVEN
14. GUIDING PRINCIPLES/RULES
15. MENTOR
16. PATTERNS (OF BEHAVIOUR)
17. COMPLEX
18. KNOWLEDGE
19. FALSE
20. NOT GIVEN
21. TRUE
22. TRUE
23. TRUE
24. ACCURATE
25. HUMAN BIAS
26. CONSENSUS
27. C
28. A
29. D
30. B
31. LAPSE/TIME INTERVAL
32. CONTINUOUS ACTION
33. TIME
34. GREATER LENGTH
35. SLOWED DOWN PROPORTIONATELY
36. A
37. C
38. G
39. E
40. F

READING 26 ANSWERS

1. TRUE
2. FALSE
3. FALSE
4. FALSE
5. TRUE
6. TRUE
7. NOT GIVEN
8. 46
9. HUMAN EYE ACCOMMODATION
10. INDO-EUROPEAN
11. RICHSRD BROCKELSBY
12. ROYAL INSTITUTION
13. GAS LIGHTING
14. D
15. F
16. E
17. C
18. A
19. D
20. A
21. C
22. C
23. A
24. C
25. C
26. A
27. E
28. F
29. H
30. H
31. I
32. G
33. D
34. B
35. BAD COUGH
36. BLOOD PRESSURE
37. FRIENDS AND FAMILY (FAMILIES)
38. PRACTITIONER
39. DIAGNOSIS
40. BACKGROUND/EXPERIENCE

READING 27 ANSWERS

1. NOT GIVEN
2. FALSE
3. NOT GIVEN
4. TRUE
5. EVERGREEN
6. NATURAL PESTICIDE
7. POWER
8. OVERNIGHT
9. NEEM CAKE
10. DOUBLES
11. NITROGEN
12. IN 2050
13. NEEM SEEDS
14. WATER PURIFICATION
15. IDENTICAL
16. BALLS OF PAPER
17. COUNT/CALCULATE EGGS
18. FRUIT FLIES
19. MOSQUITOFISH
20. SURFACE AREA
21. SUGAR WATER
22. TRUE
23. FALSE
24. NOT GIVEN
25. TRUE
26. NOT GIVEN
27. TRUE
28. FALSE
29. I
30. C
31. B
32. G
33. C
34. B
35. A
36. YES
37. YES
38. NO
39. NOT GIVEN
40. NO

READING 28 ANSWERS

1. NOT GIVEN
2. FALSE
3. TRUE
4. FALSE
5. FALSE
6. F
7. B
8. G
9. C
10. H
11. B
12. D
13. A
14. B
15. E
16. D
17. D
18. A
19. B
20. C
21. A
22. B
23. B
24. D
25. SOIL EROSION
26. PAPER
27. TRUE
28. FALSE
29. TRUE
30. TRUE
31. FALSE
32. NOT GIVEN
33. NOT GIVEN
34. KEYSTONE
35. FIG FAMILY/ FIGS
36. SEA URCHINS (URCHINS)
37. CACTUS MOTH
38. AUSTRALIA
39. PUBLIC EDUCATION

READING 29 ANSWERS

1. D
2. B
3. C
4. A
5. YES
6. NO
7. NOT GIVEN
8. YES
9. NO
10. FARMING
11. CURRY
12. NATURAL/ ORGANIC
13. CHEMICAL
14. A
15. E
16. F
17. C
18. B
19. J
20. K
21. F
22. C
23. D
24. TRUE
25. FALSE
26. TRUE
27. NOT GIVEN
28. E
29. B
30. G
31. F
32. D
33. FALSE
34. TRUE
35. NOT GIVEN
36. FALSE
37. NOT GIVEN
38. TRUE
39. D
40. B

READING 30 ANSWERS

1. E
2. A
3. C
4. G
5. F
6. SPECIFIC PERSON
7. THREE CARDS/ 3 CARDS
8. MENTAL WALK
9. LOCI METHOD
10. EDUCATION
11. A
12. D
13. B
14. E
15. A
16. B
17. C
18. D
19. NOT GIVEN
20. TRUE
21. NOT GIVEN
22. FALSE
23. C
24. B
25. C
26. A
27. B
28. SOUND LAWS
29. FASHION
30. IMPERFECT
31. PRINCIPLE OF
32. FALSE
33. FALSE
34. NOT GIVEN
35. TRUE
36. TRUE
37. NOT GIVEN
38. TRUE
39. C
40. B
41. A

READING 31 ANSWERS

1. FALSE
2. TRUE
3. TRUE
4. NOT GIVEN
5. FALSE
6. NOT GIVEN
7. TRUE
8. HISTORY OF CHILDHOOD
9. (AS) MINIATURE ADULTS
10. (WITH THE) INDUSTRIALIZATION
11. THE FACTORY ACT
12. PLAY AND EDUCATION
13. CLASSROOM
14. TRUE
15. FALSE
16. TRUE
17. NOT GIVEN
18. ELM
19. LUBRICATING OIL
20. DISH
21. 18-32
22. STRUTS
23. BRONZE
24. NECK
25. SAND
26. TOMB COMPLEX
27. II
28. V
29. I
30. VIII
31. VI
32. III
33. IV
34. 1950S
35. (BEING) SHY/SHYNESS
36. STARVATION
37. NATIVE (FISH)
38. PARTNERSHIP PROJECT/NETWORK (OF SITES)
- / PARTNERSHIP PROJECT NETWORK
39. OTTER AND BROWN – HARE
40. B

READING 32 ANSWERS

1. I
2. IX
3. IV
4. VII
5. V
6. III
7. A
8. B
9. F
10. D
11. B
12. C
13. E
14. TRUE
15. FALSE
16. NOT GIVEN
17. TRUE
18. D
19. G
20. F
21. D
22. D
23. A
24. A
25. B
26. C
27. C
28. D
29. F
30. G
31. D
32. F
33. C
34. G
35. B
36. A
37. C
38. E
39. A

READING 33 ANSWERS

1. NOT GIVEN
2. FALSE
3. TRUE
4. FALSE
5. TRUE
6. TRUE
7. NOT GIVEN
8. SPRING
9. SEDIMENT
10. RAZORBACK SUCKER
11. COMMON CARP
12. VISIBILITY
13. SAND
14. A
15. B
16. A
17. C
18. C
19. D
20. B
21. C
22. C
23. CREATE A STORY
24. BRAIN SCANS
25. OLFACTORY CORTEX
26. SPICE
27. IV
28. XII
29. II
30. X
31. I
32. IX
33. V
34. VII
35. C
36. B
37. A
38. YURI LARIN
39. COLOUR-CODING/COLOUR
40. FAMILY

READING 34 ANSWERS

1. NOT GIVEN
2. TRUE
3. FALSE
4. NOT GIVEN
5. FALSE
6. TRUE
7. TRUE
8. STONEMASON
9. GIAN GIORGIO TRISSINO
10. INIGO JONES
11. TEMPLE (ARCHITECTURE)
12. QUATTRO LIBRI DELL' ARCHITETTURA
13. BENEVOLENT CALM
14. V
15. VIII
16. VI
17. VII
18. III
19. I
20. II
21. EQUAL OPPORTUNITY
22. INTERNAL COSTS
23. C
24. C
25. A
26. B
27. C
28. A
29. B
30. D
31. I
32. D
33. J
34. F
35. C
36. YES
37. NOT GIVEN
38. NO
39. NOT GIVEN
40. YES

READING 35 ANSWERS

1. YES
2. NOT GIVEN
3. NO
4. NOT GIVEN
5. YES
6. NO
7. NOT GIVEN
8. ROCK
9. TEETH
10. DESCENDANTS
11. CANOES
12. (PREVAILING) TRADE WINDS
13. SEABIRDS AND TURTLES
14. FALSE
15. NOT GIVEN
16. TRUE
17. TRUE
18. A
19. E
20. F
21. C
22. D
23. SCALP ELECTRODES
24. INSPIRATION AND ELABORATION
25. ALPHA WAVE ACTIVITY
26. DIFFERENCE
27. G
28. A
29. C
30. B
31. H
32. D
33. C
34. A
35. B
36. FRUIT
37. PLANT TOXINS
38. BIRTH
39. WATER
40. DROUGHT

READING 36 ANSWERS

1. TRUE
2. FALSE
3. TRUE
4. NOT GIVEN
5. TRUE
6. FALSE
7. NOT GIVEN
8. SHIN BONE
9. SLOW WALKER
10. CHEETAH
11. RUN FAST
12. BLUNT
13. CRUSH
14. A
15. B
16. B
17. A
18. A
19. C
20. E
21. D
22. C
23. H
24. F
25. A
26. C
27. YES
28. NOT GIVEN
29. NO
30. YES
31. B
32. C
33. A
34. D
35. B
36. B
37. F
38. E
39. A
40. D

READING 37 ANSWERS

1. C
2. A
3. D
4. A
5. B
6. A
7. B
8. E
9. G
10. NO
11. NOT GIVEN
12. NOT GIVEN
13. YES
14. PHOTOGRAPHIC FILM
15. BAKELITE
16. SWITCHES
17. BRITAIN/UK
18. FIREPROOF
19. CLEAR AND GLASS-LIKE
20. RIGID
21. FALSE
22. NOT GIVEN
23. FALSE
24. TRUE
25. FALSE
26. TRUE
27. D
28. B
29. A
30. C
31. A
32. A
33. HIGH TIDES
34. AGRICULTURAL PRODUCTION
35. COASTAL BOUNDARIES
36. NOT GIVEN
37. NOT GIVEN
38. NO
39. YES
40. NO

READING 38 ANSWERS

1. D
2. A
3. F
4. C
5. E
6. CLERK
7. CUSTOMERS/SHOPPERS
8. LOBBY
9. STOCKROOM
10. GALLERIES
11. C
12. B
13. C
14. E
15. D
16. C
17. B
18. G
19. C
20. F
21. E
22. D
23. A
24. CHICKENS
25. AD-36
26. GENE
27. VACCINE
28. YES
29. NO
30. YES
31. NOT GIVEN
32. NO
33. YES
34. C
35. A
36. B
37. D
38. A
39. C
40. E

READING 39 ANSWERS

1. ABILITIES
2. PARENTS
3. MARKETS
4. SIBLINGS
5. EXPERIENCED
6. NOT GIVEN
7. TRUE
8. TRUE
9. FALSE
10. FIRM
11. SIMPLICITY
12. FULL VERSION
13. FEEDBACK
14. TREE
15. SOFT
16. SHEEP
17. MINES
18. STRING
19. CLAY
20. GREASE
21. TRUE
22. NOT GIVEN
23. FALSE
24. FALSE
25. FALSE
26. FALSE
27. C
28. A
29. D
30. B
31. C
32. A
33. E
34. F
35. NO
36. NOT GIVEN
37. NO
38. YES
39. NO
40. NOT GIVEN

READING 40 ANSWERS

1. D
2. B
3. F
4. C
5. A
6. E
7. D
8. G
9. F
10. C
11. B
12. D
13. E
14. A
15. NOT GIVEN
16. FALSE
17. TRUE
18. FALSE
19. A DETAILED MAP
20. THE TEETH/TEETH OF SKELETONS
21. 9000 YEARS OLD
22. INJURIES
23. STRENUOUS
24. PROTEIN
25. HUNTING
26. COWS
27. TRANSITIONAL
28. VI
29. VII
30. I
31. V
32. VIII
33. A
34. D
35. C
36. D
37. E
38. A
39. C
40. F



Er Indroop
Singh Makkar



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Kaur Makkar

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English for Exams

About the book

I have been teaching IELTS students for over 12 years now. My passion for teaching landed me into IELTS coaching, although primarily I am a gynaecologist. This book is the fifth in the series of my books for IELTS, which contains readings for exam practice. My earlier books on writing and speaking have fetched remarkable sales. This book is meant to help the average student prepare for the IELTS Reading Test.

This is the second volume of Academic Reading Book and it also has 20 academic readings for exam practice. These readings are comparable to the level that students get in the actual exam and topics of the readings are also similar to the ones asked in the exam. The beginning of the book includes strategies on how to approach the IELTS reading exam along with individual question types.

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