

Reading Practice Test 1

READING PASSAGE 1

You should spend about 20 minutes on **Questions 1-13**, which are based on Reading Passage 1 below.

William Gilbert and Magnetism

A

The 16th and 17th centuries saw two great pioneers of modern science: Galileo and Gilbert. The impact of their findings is eminent. Gilbert was the first modern scientist, also the accredited father of the science of electricity and magnetism, an Englishman of learning and a physician at the court of Elizabeth. Prior to him, all that was known of electricity and magnetism was what the ancients knew, nothing more than that the lodestone possessed magnetic properties and that amber and jet, when rubbed, would attract bits of paper or other substances of small specific gravity. However, he is less well known than he deserves.

B

Gilbert's birth pre-dated Galileo. Born in an eminent local family in Colchester County in the UK, on May 24, 1544, he went to grammar school, and then studied medicine at St John's College, Cambridge, graduating in 1573. Later he travelled in the continent and eventually settled down in London.

C

He was a very successful and eminent doctor. All this culminated in his election to the president of the Royal Science Society. He was also appointed personal physician to the Queen (Elizabeth I), and later knighted by the Queen. He faithfully served her until her death. However, he didn't outlive the Queen for long and died on November 30, 1603, only a few months after his appointment as personal physician to King James.

D

Gilbert was first interested in chemistry but later changed his focus due to the large portion of mysticism of alchemy involved (such as the transmutation of metal). He gradually developed his interest in physics after the great minds of the ancient, particularly about the knowledge the ancient Greeks had about lodestones, strange minerals with the power to attract iron. In the meantime, Britain became a major seafaring nation in 1588 when the Spanish Armada was defeated, opening the way to British settlement of America. British ships depended on the magnetic compass, yet no one understood why it worked. Did the Pole Star attract it, as Columbus once speculated; or was there a magnetic mountain at the pole, as described in *Odyssey*, which ships would never approach, because the sailors thought its pull would yank out all their iron nails and fittings? For nearly 20 years, William Gilbert conducted ingenious experiments to understand magnetism. His works include *On the Magnet*, *Magnetic Bodies*, and *the Great Magnet of the Earth*.

E

Gilbert's discovery was so important to modern physics. He investigated the nature of magnetism and electricity. He even coined the word "electric". Though the early beliefs of magnetism were also largely entangled with superstitions such as that rubbing garlic on lodestone can neutralise its magnetism, one example being that sailors even believed the smell of garlic would even interfere with the action of compass, which is why helmsmen were forbidden to eat it near a ship's compass. Gilbert also found that metals can be magnetised by rubbing materials such as fur, plastic or the like on them. He named the ends of a magnet "north pole" and "south pole". The magnetic poles can attract or repel, depending on polarity. In addition, however, ordinary iron is always attracted to a magnet. Though he started to study the relationship between magnetism and electricity, sadly he didn't complete it. His

research of static electricity using amber and jet only demonstrated that objects with electrical charges can work like magnets attracting small pieces of paper and stuff. It is a French guy named du Fay that discovered that there are actually two electrical charges, positive and negative.

F

He also questioned the traditional astronomical beliefs. Though a Copernican, he didn't express in his quintessential beliefs whether the earth is at the centre of the universe or in orbit around the sun. However, he believed that stars are not equidistant from the earth but have their own earth-like planets orbiting around them. The earth itself is like a giant magnet, which is also why compasses always point north. They spin on an axis that is aligned with the earth's polarity. He even likened the polarity of the magnet to the polarity of the earth and built an entire magnetic philosophy on this analogy. In his explanation, magnetism is the soul of the earth. Thus a perfectly spherical lodestone, when aligned with the earth's poles, would wobble all by itself in 24 hours. Further, he also believed that the sun and other stars wobble just like the earth does around a crystal core, and speculated that the moon might also be a magnet caused to orbit by its magnetic attraction to the earth. This was perhaps the first proposal that a force might cause a heavenly orbit.

G

His research method was revolutionary in that he used experiments rather than pure logic and reasoning like the ancient Greek philosophers did. It was a new attitude towards scientific investigation. Until then, scientific experiments were not in fashion. It was because of this scientific attitude, together with his contribution to our knowledge of magnetism, that a unit of magneto motive force, also known as magnetic potential, was named Gilbert in his honour. His approach of careful observation and experimentation rather than the authoritative opinion or deductive philosophy of others had laid the very foundation for modern science.

Questions 1-7

Reading Passage 1 has seven paragraphs **A-G**. Choose the correct heading for each paragraph from the list of headings below. Write the correct number **i-x** in boxes **1-7** on your answer sheet.

List of headings

- i** Early years of Gilbert
- ii** What was new about his scientific research method
- iii** The development of chemistry
- iv** Questioning traditional astronomy
- v** Pioneers of the early science
- vi** Professional and social recognition
- vii** Becoming the president of the Royal Science Society
- viii** The great works of Gilbert
- ix** His discovery about magnetism
- x** His change of focus

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

Questions 8-10

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

In boxes **8-10** 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

- 8 He is less famous than he should be.
9 He was famous as a doctor before he was employed by the Queen.
10 He lost faith in the medical theories of his time.

Questions 11-13

Choose **THREE** letters **A-F**. Write your answers in boxes **11-13** on your answer sheet.

Which **THREE** of the following are parts of Gilbert's discovery?

- A** Metal can be transformed into another.
B Garlic can remove magnetism,
C Metals can be magnetised.
D Stars are at different distances from the earth.
E The earth wobbles on its axis.
F There are two charges of electricity.

READING PASSAGE 2

You should spend about 20 minutes on **Questions 14-26**, which are based on Reading Passage 2 below.

The 2003 Heatwave

It was the summer, scientists now realise, when global warming at last made itself unmistakably felt. We knew that summer 2003 was remarkable: Britain experienced its record high temperature and continental Europe saw forest fires raging out of control, great rivers drying to a trickle and thousands of heat related deaths. But just how remarkable is only now becoming clear.

The three months of June, July and August were the warmest ever recorded in western and central Europe, with record national highs in Portugal, Germany and Switzerland as well as in Britain. And they were the warmest by a very long way. Over a great rectangular block of the earth stretching from west of Paris to northern Italy, taking in Switzerland and southern Germany, the average temperature for the summer months was 3.78°C above the long-term norm, said the Climatic Research Unit (CRU) of the University of East Anglia in Norwich, which is one of the world's leading institutions for the monitoring and analysis of temperature records.

That excess might not seem a lot until you are aware of the context but then you realise it is enormous. There is nothing like this in previous data, anywhere. It is considered so exceptional that Professor Phil Jones, the CRU's director, is prepared to say openly in a way few scientists have done before - that the 2003 extreme may be directly attributed, not to natural climate variability, but to global warming caused by human actions.

Meteorologists have hitherto contented themselves with the formula that recent high temperatures are "consistent with predictions" of climate change. For the great block of the map that stretching

between 35-50N and 0-20E - the CRU has reliable temperature records dating back to 1781. Using as a baseline the average summer temperature recorded between 1961 and 1990, departures from the temperature norm, or "anomalies", over the area as a whole can easily be plotted. As the graph shows, such is the variability of our climate that over the past 200 years, there have been at least half a dozen anomalies, in terms of excess temperature - the peaks on the graph denoting very hot years approaching, or even exceeding, 2°C. But there has been nothing remotely like 2003, when the anomaly is nearly four degrees.

"This is quite remarkable," Professor Jones told *The Independent*. "It's very unusual in a statistical sense. If this series had a normal statistical distribution, you wouldn't get this number. The return period [how often it could be expected to recur] would be something like one in a thousand years. If we look at an excess above the average of nearly four degrees, then perhaps nearly three degrees of that is natural variability, because we've seen that in past summers. But the final degree of it is likely to be due to global warming, caused by human actions."

The summer of 2003 has, in a sense, been one that climate scientists have long been expecting. Until now, the warming has been manifesting itself mainly in winters that have been less cold than in summers that have been much hotter. Last week, the United Nations predicted that winters were warming so quickly that winter sports would die out in Europe's lower level ski resorts. But sooner or later, the unprecedented hot summer was bound to come, and this year it did.

One of the most dramatic features of the summer was the hot nights, especially in the first half of August. In Paris, the temperature never dropped below 23°C (73.4°F) at all between 7 and 14 August, and the city recorded its warmest-ever night on 11-12 August, when the mercury did not drop below 25.5°C (77.9°F). Germany recorded its warmest-ever night at Weinbiet in the Rhine Valley with a lowest figure of 27.6°C (80.6°F) on 13 August, and similar record breaking nighttime temperatures were recorded in Switzerland and Italy.

The 15,000 excess deaths in France during August, compared with previous years, have been related to the high night-time temperatures. The number gradually increased during the first 12 days of the month, peaking at about 2,000 per day on the night of 12-13 August, then fell off dramatically after 14 August when the minimum temperatures fell by about 5°C. The elderly were most affected, with a 70 per cent increase in mortality rate in those aged 75-94.

For Britain, the year as a whole is likely to be the warmest ever recorded, but despite the high temperature record on 10 August, the summer itself defined as the June, July and August period still comes behind 1976 and 1995, when there were longer periods of intense heat. "At the moment, the year is on course to be the third hottest ever in the global temperature record, which goes back to 1856, behind 1998 and 2002, but when all the records for October, November and December are collated, it might move into second place" Professor Jones said. The ten hottest years in the record have all now occurred since 1990. Professor Jones is in no doubt about the astonishing nature of European summer of 2003. "The temperatures recorded were out of all proportion to the previous record," he said.

"It was the warmest summer in the past 500 years and probably way beyond that. It was enormously exceptional.

" His colleagues at the University of East Anglia's Tyndall Centre for Climate Change Research are now planning a special study of it. "It was a summer that has not been experienced before, either in terms of the temperature extremes that were reached, or the range and diversity of the impacts of the extreme heat," said the centre's executive director, Professor Mike Hulme.

"It will certainly have left its mark on a number of countries, as to how they think and plan for climate change in the future, much as the 2000 floods have revolutionised the way the Government is thinking about flooding in the UK. The 2003 heatwave will have similar repercussions across Europe."

Questions 14-19

Do the following statements agree with the information given in Reading Passage 2? In boxes **14-19** 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 this

- 14 The average summer temperature in 2003 is almost 4 degrees higher than the average temperature of the past.
- 15 Global warming is caused by human activities.
- 16 Jones believes the temperature variation is within the normal range.
- 17 The temperature is measured twice a day in major cities.
- 18 There were milder winters rather than hotter summers.
- 19 Governments are building new high-altitude ski resorts.

Questions 20-21

Answer the questions below using **NO MORE THAN TWO WORDS AND/OR NUMBERS** from the passage for each answer. Write your answers in boxes **20-21** on your answer sheet. What are the other two hottest years in Britain besides 2003?

20

What has also influenced government policies like the hot summer in 2003?

21

Questions 22-25

Complete the summary below using **NO MORE THAN THREE WORDS** from the passage for each answer.

Write your answers in boxes **22-25** on your answer sheet.

The other two hottest years around the globe were 22

The ten hottest years on record all come after the year 23

This temperature data has been gathered since 24

Thousands of people died in the country of 25

Question 26

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

Write your answer in box **26** on your answer sheet.

26 Which one of the following can be best used as the title of this passage?

- A Global Warming
- B What Caused Global Warming
- C The Effects of Global Warming
- D That Hot Year in Europe

READING PASSAGE 3

You should spend about 20 minutes on **Questions 27-40**, which are based on Reading Passage 3 below.

Amateur Naturalists

From the results of an annual Alaskan betting contest to sightings of migratory birds, ecologists are using a wealth of unusual data to predict the impact of climate change.

A

Tim Sparks slides a small leather-bound notebook out of an envelope. The book's yellowing pages contain bee-keeping notes made between 1941 and 1969 by the late Walter Coates of Kilworth, Leicestershire. He adds it to his growing pile of local journals, birdwatchers' lists and gardening diaries. "We're uncovering about one major new record each month," he says, "I still get surprised." Around two centuries before Coates, Robert Marsham, a landowner from Norfolk in the east of England, began recording the life cycles of plants and animals on his estate when the first wood anemones flowered, the dates on which the oaks burst into leaf and the rooks began nesting. Successive Marshams continued compiling these notes for 211 years.

B

Today, such records are being put to uses that their authors could not possibly have expected. These data sets, and others like them, are proving invaluable to ecologists interested in the timing of biological events, or phenology. By combining the records with climate data, researchers can reveal how, for example, changes in temperature affect the arrival of spring, allowing ecologists to make improved predictions about the impact of climate change. A small band of researchers is combing through hundreds of years of records taken by thousands of amateur naturalists. And more systematic projects have also started up, producing an overwhelming response. "The amount of interest is almost frightening," says Sparks, a climate researcher at the Centre for Ecology and Hydrology in Monks Wood, Cambridgeshire.

C

Sparks first became aware of the army of "closet phenologists", as he describes them, when a retiring colleague gave him the Marsham records. He now spends much of his time following leads from one historical data set to another. As news of his quest spreads, people tip him off to other historical records, and more amateur phenologists come out of their closets. The British devotion to recording and collecting makes his job easier one man from Kent sent him 30 years' worth of kitchen calendars, on which he had noted the date that his neighbour's magnolia tree flowered.

D

Other researchers have unearthed data from equally odd sources. Rafe Sagarin, an ecologist at Stanford University in California, recently studied records of a betting contest in which participants attempt to guess the exact time at which a specially erected wooden tripod will fall through the surface of a thawing river. The competition has taken place annually on the Tenana River in Alaska since 1917, and analysis of the results showed that the thaw now arrives five days earlier than it did when the contest began.

E

Overall, such records have helped to show that, compared with 20 years ago, a raft of natural events now occur earlier across much of the northern hemisphere, from the opening of leaves to the return of birds from migration and the emergence of butterflies from hibernation. The data can also hint at how nature will change in the future. Together with models of climate change, amateurs' records could help guide conservation. Terry Root, an ecologist at the University of Michigan in Ann Arbor, has collected birdwatchers' counts of wildfowl taken between 1955 and 1996 on seasonal ponds in the American Midwest and combined them with climate data and models of future warming. Her analysis shows that the increased droughts that the models predict could halve the breeding populations at the ponds. "The number of waterfowl in North America will most probably drop significantly with global warming," she says.

F

But not all professionals are happy to use amateur data. "A lot of scientists won't touch them, they say they're too full of problems," says Root. Because different observers can have different ideas of what constitutes, for example, an open snowdrop. "The biggest concern with ad hoc observations is how carefully and systematically they were taken," says Mark Schwartz of the University of Wisconsin, Milwaukee, who studies the interactions between plants and climate. "We need to know pretty precisely what a person's been observing - if they just say 'I noted when the leaves came out', it might not be that useful." Measuring the onset of autumn can be particularly problematic because deciding when leaves change colour is a more subjective process than noting when they appear.

G

Overall, most phenologists are positive about the contribution that amateurs can make. "They get at the raw power of science: careful observation of the natural world," says Sagarin. But the professionals also acknowledge the need for careful quality control. Root, for example, tries to gauge the quality of an amateur archive by interviewing its collector. "You always have to worry things as trivial as vacations can affect measurement. I disregard a lot of records because they're not rigorous enough," she says. Others suggest that the right statistics can iron out some of the problems with amateur data. Together with colleagues at Wageningen University in the Netherlands, environmental scientist Arnold van Vliet is developing statistical techniques to account for the uncertainty in amateur phenological data. With the enthusiasm of amateur phenologists evident from past records, professional researchers are now trying to create standardised recording schemes for future efforts. They hope that well designed studies will generate a volume of observations large enough to drown out the idiosyncrasies of individual recorders. The data are cheap to collect, and can provide breadth in space, time and range of species. "It's very difficult to collect data on a large geographical scale without enlisting an army of observers," says Root.

H

Phenology also helps to drive home messages about climate change. "Because the public understand these records, they accept them," says Sparks. It can also illustrate potentially unpleasant consequences, he adds, such as the finding that more rat infestations are reported to local councils in warmer years. And getting people involved is great for public relations. "People are thrilled to think that the data they've been collecting as a hobby can be used for something scientific it empowers them," says Root.

Questions 27-33

Reading Passage 3 has eight paragraphs **A-H**.

Which paragraph contains the following information?

Write the correct letter **A-H** in boxes **27-33** on your answer sheet.

- 27 The definition of phenology
- 28 How Sparks first became aware of amateur records
- 29 How people reacted to their involvement in data collection
- 30 The necessity to encourage amateur data collection
- 31 A description of using amateur records to make predictions
- 32 Records of a competition providing clues to climate change
- 33 A description of a very old record compiled by generations of amateur naturalists

Questions 34-36

Complete the sentences below with **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in boxes **34-36** on your answer sheet.

Walter Coates’s records largely contain the information of

34

Robert Marsham is famous for recording the 35 of animals and plants on his land.

According to some phenologists, global warming may cause the number of waterfowl in North America to drop significantly due to increased

36

Questions 37-40

Choose the correct letter **A, B, C** or **D**. Write your answers in boxes **37-40** on your answer sheet.

37 Why do a lot of scientists discredit the data collected by amateurs?

- A Scientific methods were not used in data collection.
- B Amateur observers are not careful in recording their data.
- C Amateur data is not reliable.
- D Amateur data is produced by wrong candidates.

38 Mark Schwartz used the example of leaves to illustrate that

- A amateur records can’t be used.
- B amateur records are always unsystematic.
- C the colour change of leaves is hard to observe.
- D valuable information is often precise.

39 How do the scientists suggest amateur data should be used?

- A Using improved methods
- B Being more careful in observation
- C Using raw materials
- D Applying statistical techniques in data collection

40 What’s the implication of phenology for ordinary people?

- A It empowers the public.
- B It promotes public relations.
- C It warns people of animal infestation.
- D It raises awareness about climate change in the public.

Reading Practice Test 2

READING PASSAGE 1

You should spend about 20 minutes on **Questions 1-13**, which are based on Reading Passage 1 below.

Education Philosophy

A

Although we lack accurate statistics about child mortality in the pre-industrial period, we do have evidence that in the 1660s, the mortality rate for children who died within 14 days of birth was as much as 30 per cent. Nearly all families suffered some premature death. Since all parents expected to bury some of their children, they found it difficult to invest in their newborn children. Moreover, to protect themselves from the emotional consequences of children's death, parents avoided making any emotional commitment to an infant. It is no wonder that we find mothers leave their babies in gutters or refer to the death in the same paragraph with reference to pickles.

B

The 18th century witnessed the transformation from an agrarian economy to an industrial one, one of the vital social changes taking place in the Western world. An increasing number of people moved from their villages and small towns to big cities where life was quite different. Social supports which had previously existed in smaller communities were replaced by ruthless problems such as poverty, crime, substandard housing and disease. Due to the need for additional income to support the family, young children from the poorest families were forced into early employment and thus their childhood became painfully short. Children as young as 7 might be required to work full-time, subjected to unpleasant and unhealthy circumstances, from factories to prostitution. Although such a role has disappeared in most wealthy countries, the practice of childhood employment still remains a staple in underdeveloped countries and rarely disappeared entirely.

C

The lives of children underwent a drastic change during the 1800s in the United States. Previously, children from both rural and urban families were expected to participate in everyday labour due to the bulk of manual hard working. Nevertheless, thanks to the technological advances of the mid-1800s, coupled with the rise of the middle class and redefinition of roles of family members, work and home became less synonymous over time. People began to purchase toys and books for their children. When the country depended more upon machines, children in rural and urban areas, were less likely to be required to work at home. Beginning from the Industrial Revolution and rising slowly over the course of the 19th century, this trend increased exponentially after civil war. John Locke, one of the most influential writers of his period, created the first clear and comprehensive statement of the 'environmental position' that family education determines a child's life, and via this, he became the father of modern learning theory. During the colonial period, his teachings about child care gained a lot of recognition in America.

D

According to Jean Jacques Rousseau, who lived in an era of the American and French Revolution, people were 'noble savages' in the original state of nature, meaning they are innocent, free and uncorrupted. In 1762, Rousseau wrote a famous novel **Emile** to convey his educational philosophy through a story of a boy's education from infancy to adulthood. This work was based on his extensive observation of children and adolescents, their individuality, his developmental theory and on the memories of his own childhood. He contrasts children with adults and describes their age specific

characteristics in terms of historical perspective and developmental psychology. Johan Heinrich Pestalozzi, living during the early stages of the Industrial Revolution, sought to develop schools to nurture children's all round development. He agreed with Rousseau that humans are naturally good but were spoiled by a corrupt society. His approach to teaching consists of the general and special methods, and his theory was based upon establishing an emotionally healthy homelike learning environment, which had to be in place before more specific instructions occurred.

E

One of the best documented cases of Pestalozzi's theory concerned a so-called feral child named Victor, who was captured in a small town in the south of France in 1800. Prepubescent, mute, naked, and perhaps 11 or 12 years old, Victor had been seen foraging for food in the gardens of the locals in the area and sometimes accepted people's direct offers of food before his final capture. Eventually, he was brought to Paris and expected to answer some profound questions about the nature of human, but that goal was quashed very soon. A young physician Jean Marc Gaspard Itard was optimistic about the future of Victor and initiated a five-year education plan to civilise him and teach him to speak. With a subsidy from the government, Itard recruited a local woman Madame Guerin to assist him to provide a semblance of a home for Victor, and he spent an enormous amount of time and effort working with Victor. Itard's goal to teach Victor the basics of speech could never be fully achieved, but Victor had learnt some elementary forms of communication.

F

Although other educators were beginning to recognise the simple truth embedded in Rousseau's philosophy, it is not enough to identify the stages of children's development alone. There must be certain education which had to be geared towards those stages. One of the early examples was the invention of kindergarten, which was a word and a movement created by a German born educator, Friedrich Froebel in 1840. Froebel placed a high value on the importance of play in children's learning. His invention would spread around the world eventually in a verity of forms. Froebel's ideas were inspired through his cooperation with Johann Heinrich Pestalozzi. Froebel didn't introduce the notion of kindergarten until 58 years old, and he had been a teacher for four decades. The notion was a haven and a preparation for children who were about to enter the regimented educational system. The use of guided or structured play was a cornerstone of his kindergarten education because he believed that play was the most significant aspect of development at this time of life. Play served as a mechanism for a child to grow emotionally and to achieve a sense of self worth. Meanwhile, teachers served to organise materials and a structured environment in which each child, as an individual, could achieve these goals. When Froebel died in 1852, dozens of kindergartens had been created in Germany. Kindergartens began to increase in Europe, and the movement eventually reached and flourished in the United States in the 20th century.

Questions 1-4

Reading Passage 1 has six paragraphs, **A-F**.

Choose the correct heading for paragraphs **A** and **C-E** from the list of headings below.

Write the correct number, **i-vii**, in boxes **1-4** on your answer sheet.

List of Headings

- i** The inheritance and development of educational concepts of different thinkers
- ii** Why children had to work to alleviate the burden on family
- iii** Why children are not highly valued
- iv** The explanation for children dying in hospital at their early age

- v The first appearance of modern educational philosophy
- vi The application of a creative learning method on a wild kid
- vii The emergence and spread of the notion of kindergarten

1 Paragraph A

Example Answer

Paragraphs ii

- 2 Paragraph C
- 3 Paragraph D
- 4 Paragraph E

Questions 5-8

Look at the following events (Questions 5-8) and the list of dates below. Match each event with the correct date, **A**, **B** or **C**. Write the correct letter, **A**, **B** or **C**, in boxes 5-8 on your answer sheet.

NB You may use any letter more than once.

List of Dates

- A** the 18th century (1700-1799)
- B** the 19th century (1800-1899)
- C** the 20th century (1900-1999)
- 5 the need for children to work
- 6 the rise of the middle class
- 7 the emergence of a kindergarten
- 8 the spread of kindergartens around the U.S.

Questions 9-13

Look at the following opinions or deeds (Questions 9-13) and the list of people below. Match each opinion or deed with the correct person, **A**, **B**, **C** or **D**. Write the correct letter, **A**, **B**, **C** or **D**, in boxes 9-13 on your answer sheet.

NB You may use any letter more than once.

List of People

- A** Jean Jacques Rousseau
- B** Johan Heinrich Pestalozzi
- C** Jean Marc Gaspard Itard
- D** Friedrich Froebel
- 9 was not successful to prove the theory
- 10 observed a child's record
- 11 requested a study setting with emotional comfort firstly
- 12 proposed that corruption was not a characteristic in people's nature
- 13 was responsible for an increase in the number of a type of school

READING PASSAGE 2

You should spend about 20 minutes on **Questions 14-26**, which are based on Reading Passage 2 below.

How deserts are formed?

A

A desert refers to a barren section of land, mainly in arid and semi arid areas, where there is almost no precipitation, and the environment is hostile for any creature to inhabit. Deserts have been classified in a number of ways, generally combining total precipitation, how many days the rainfall occurs, temperature, humidity, and sometimes additional factors. In some places, deserts have clear boundaries marked by rivers, mountains or other landforms, while in other places, there are no clear-cut borders between desert and other landscape features.

B

In arid areas where there is not any covering of vegetation protecting the land, sand and dust storms will frequently take place. This phenomenon often occurs along the desert margins instead of within the deserts, where there are already no finer materials left. When a steady wind starts to blow, fine particles on the open ground will begin vibrating. As the wind picks up, some of the particles are lifted into the air. When they fall onto the ground, they hit other particles which will then be jerked into the air in their turn, initiating a chain reaction.

C

There has been a tremendous deal of publicity on how severe desertification can be, but the academic circle has never agreed on the causes of desertification. A common misunderstanding is that a shortage of precipitation causes the desertification even the land in some barren areas will soon recover after the rain falls. In fact, more often than not, human activities are responsible for desertification. It might be true that the explosion in world population, especially in developing countries, is the primary cause of soil degradation and desertification. Since the population has become denser, the cultivation of crops has gone into progressively drier areas. It's especially possible for these regions to go through periods of severe drought, which explains why crop failures are common. The raising of most crops requires the natural vegetation cover to be removed first; when crop failures occur, extensive tracts of land are devoid of a plant cover and thus susceptible to wind and water erosion. All through the 1990s, dryland areas went through a population growth of 18.5 per cent, mostly in severely impoverished developing countries.

D

Livestock farming in semi-arid areas accelerates the erosion of soil and becomes one of the reasons for advancing desertification. In such areas where the vegetation is dominated by grasses, the breeding of livestock is a major economic activity. Grasses are necessary for anchoring barren topsoil in a dryland area. When a specific field is used to graze an excessive herd, it will experience a loss in vegetation coverage, and the soil will be trampled as well as be pulverised, leaving the topsoil exposed to destructive erosion elements such as winds and unexpected thunderstorms. For centuries, nomads have grazed their flocks and herds to any place where pasture can be found, and oases have offered chances for a more settled way of living. For some nomads, wherever they move to, the desert follows.

E

Trees are of great importance when it comes to maintaining topsoil and slowing down the wind speed. In many Asian countries, firewood is the chief fuel used for cooking and heating, which has caused uncontrolled clear-cutting of forests in dryland ecosystems. When too many trees are cut down,

windstorms and dust storms tend to occur.

F

What's worse, even political conflicts and wars can also contribute to desertification. To escape from the invading enemies, the refugees will move altogether into some of the most vulnerable ecosystems on the planet. They bring along their cultivation traditions, which might not be the right kind of practice for their new settlement.

G

In the 20th century, one of the states of America had a large section of farmland that had turned into desert. Since then, actions have been enforced so that such a phenomenon of desertification will not happen again. To avoid the reoccurring of desertification, people shall find other livelihoods which do not rely on traditional land uses, are not as demanding on local land and natural resource, but can still generate viable income. Such livelihoods include but are not limited to dryland aquaculture for the raising of fish, crustaceans and industrial compounds derived from microalgae, greenhouse agriculture, and activities that are related to tourism. Another way to prevent the reoccurring of desertification is bringing about economic prospects in the city centres of drylands and places outside drylands. Changing the general economic and institutional structures that generate new chances for people to support themselves would alleviate the current pressures accompanying the desertification processes.

H

In nowadays society, new technologies are serving as a method to resolve the problems brought by desertification. Satellites have been utilised to investigate the influence that people and livestock have on our planet Earth. Nevertheless, it doesn't mean that alternative technologies are not needed to help with the problems and process of desertification.

Questions 14-20

Reading Passage 2 has eight paragraphs, **A-H**.

Which paragraph contains the following information?

Write the correct letter, **A-H**, in boxes **14-20** on your answer sheet.

NB You may use any letter more than once.

- 14 a reference to the irregular movement of particles
- 15 mention of a productive land turning into a desert in the 20th century
- 16 types of deserts
- 17 mention of technical methods used to tackle the problems of deserts
- 18 the influence of migration on desertification
- 19 lack of agreement among the scientists about the causes of desertification
- 20 a description of the fatal effects of farming practice

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 is true

FALSE if the statement is false

NOT GIVEN if the information is not given in the passage

- 21 It is difficult to ascertain where the deserts end in some areas.
- 22 Media is uninterested in the problems of desertification.

- 23 The most common cause of desertification is the lack of rainfall.
- 24 Farming animals in semi-arid areas will increase soil erosion.
- 25 People in Asian countries no longer use firewood as the chief fuel.
- 26 Technology studying the relationship of people, livestock and desertification has not yet been invented.

READING PASSAGE 3

You should spend about 20 minutes on **Questions 27-40**, which are based on Reading Passage 3 below.

The Olympic Torch

Since 776 B.C., when the Greek people held their first ever Olympic Games, the Games were hosted every four years at the Olympia city. Back then, a long journey for the Olympic torch was made before the opening ceremony of each Olympic Games. The Greek people would light a cauldron of flames on the altar, a ritual devoted to Hera, the Greek Goddess of birth and marriage.

The reintroduction of flame to the Olympics occurred at the Amsterdam 1928 Games, for which a cauldron was lit yet without a torch relay. The 1936 Berlin Summer Games held the first Olympic torch relay, which was not resumed in the Winter Olympics until in 1952. However, in that year the torch was lit not in Olympia, Greece, but in Norway, which was considered as the birthplace of skiing. Until the Innsbruck 1964 Winter Olympics in Austria, the Olympic flame was reignited at Olympia.

The torch is originally an abstract concept of a designer or groups of designers. A couple of design groups hand in their drafts to the Olympic Committee in the hope that they would get the chance to create the torch. The group that wins the competition will come up with a design for a torch that has both aesthetic and practical value. After the torch is completed, it has to succeed in going through all sorts of severe weather conditions. The appearance of the modern Olympic torch is attributed to a Disney artist John Hench, who designed the torch for the 1960 Winter Olympics in Squaw Valley, California. His design laid a solid foundation for all the torches in the future.

The long trip to the Olympic area is not completed by one single torch, but by thousands of them, so the torch has to be replicated many times. Approximately 10,000 to 15,000 torches are built to fit thousands of runners who take the torches through every section of the Olympic relay. Every single runner can choose to buy his or her torch as a treasurable souvenir when he or she finishes his or her part of the relay.

The first torch in the modern Olympics (the 1936 Berlin Games) was made from a slender steel rod with a circular platform at the top and a circular hole in the middle to jet flames. The name of the runner was also inscribed on the platform as a token of thanks. In the earlier days, torches used everything from gunpowder to olive oil as fuels. Some torches adopted a combination of hexamine and naphthalene with a flammable fluid.

However, these materials weren't exactly the ideal fuel sources, and they could be quite hazardous sometimes. In the 1956 Olympics, the torch in the final relay was ignited by magnesium and aluminium, but some flaming pieces fell off and seared the runner's arms. To promote the security rate, liquid fuels made its first appearance at the 1972 Munich Games. Since then, torches have been

using fuels which are pressurised into the form of a liquid. When the fuels are burnt, they turn into gas to produce a flame. Liquid fuel becomes safer for the runner and can be stored in a light container. The torch at the 1996 Atlanta Summer Olympics is equipped with an aluminium base that accommodates a tiny fuel tank. As the fuel ascends through the modified handle, it is squeezed through a brass valve that has thousands of little openings. As the fuel passes through the tiny openings, it accumulates pressure. Once it makes its way through the openings, the pressure decreases and the liquid becomes gas so it can bum up.

The torch in 1996 was fuelled by propylene, a type of substance that could give out a bright flame. However, since propylene was loaded with carbon, it would produce plenty of smoke which was detrimental to the environment. In 2000, the designers of the Sydney Olympic torch proposed a lighter and cheaper design, which was harmless to the environment. For the fuel, they decided to go with a combination of 35 per cent propane (a gas that is used for cooking and heating) and 65 per cent butane (a gas that is obtained from petroleum), thus creating a powerful flame without generating much smoke.

Both the 1996 and 2000 torches adopted a double flame burning system, enabling the flames to stay lit even in severe weather conditions. The exterior flame bums at a slower rate and at a lower temperature. It can be perceived easily with its big orange flame, but it is unstable. On the other hand, the interior flame bums faster and hotter, generating a small blue flame with great stability, due to the internal site offering protection of it from the wind. Accordingly, the interior flame would serve as a pilot light, which could relight the external flame if it should go out.

As for the torch of 2002 Olympics in Salt Lake City, the top section was made of glass in which the flame burned, for the purpose of echoing the theme of 'Light the Fire Within' of that Olympics. This torch was of great significance for the following designs of the torches.

Questions 27-29

Complete the summary below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in **boxes 27-29** on your answer sheet.

The Olympic torch, as requested by the Olympic Committee, will be carefully designed so that it is capable of withstanding all kinds of 27 Generally, the design of the modern Olympic torch enjoys the 28 value. The torch must be copied, and thousands of torches are constructed to accommodate thousands of runners who will carry them through each leg of the Olympic relay. Each runner has an opportunity to purchase the torch as a(n) 29 at the end of his or her leg of the relay.

Questions 30-35

Look at the following statements (Questions **30-35**) and the list of Olympic torches below. Match each statement with the correct Olympic torch, **A-H**. Write the correct letter, **A-H**, in boxes **30-35** on your answer sheet.

List of Olympic Torches

- A** ancient Greek Olympic flames
- B** Berlin Games torch (1936)
- C** 1952 Winter Games flame

- D 1956 Games torch
- E Munich Games torch (1972)
- F 1996 torch (Atlanta)
- G 2000 torch (Sydney)
- H 2002 torch (Salt Lake City)
- 30 first liquid fuel
- 31 not environmentally friendly
- 32 beginning to record the runners' name
- 33 potentially risky as it burnt the runner's arms
- 34 special for a theme of 'Light'
- 35 not lit in Greek

Questions 36-40

Label the diagram below.

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

Write your answers in boxes **36-40** on your answer sheet.

- 36
- 37
- 38
- 39
- 40

Reading Practice Test 3

READING PASSAGE 1

You should spend about 20 minutes on **Questions 1-13**, which are based on Reading Passage 1 below.

Learning by Examples

A

Learning Theory is rooted in the work of Ivan Pavlov, the famous scientist who discovered and documented the principles governing how animals (humans included) learn in the 1900s. Two basic kinds of learning or conditioning occur, one of which is famously known as the classical conditioning. Classical conditioning happens when an animal learns to associate a neutral stimulus (signal) with a stimulus that has intrinsic meaning based on how closely in time the two stimuli are presented. The classic example of classical conditioning is a dog's ability to associate the sound of a bell (something that originally has no meaning to the dog) with the presentation of food (something that has a lot of meaning to the dog) a few moments later. Dogs are able to learn the association between bell and food, and will salivate immediately after hearing the bell once this connection has been made. Years of learning research have led to the creation of a highly precise learning theory that can be used to understand and predict how and under what circumstances most any animal will learn, including human beings, and eventually help people figure out how to change their behaviours.

B

Role models are a popular notion for guiding child development, but in recent years very interesting research has been done on learning by examples in other animals. If the subject of animal learning is taught very much in terms of classical or operant conditioning, it places too much emphasis on how we

allow animals to learn and not enough on how they are equipped to learn. To teach a course of mine, I have been dipping profitably into a very interesting and accessible compilation of papers on social learning in mammals, including chimps and human children, edited by Heyes and Galef (1996).

C

The research reported in one paper started with a school field trip to Israel to a pine forest where many pine cones were discovered, stripped to the central core. So the investigation started with no weighty theoretical intent, but was directed at finding out what was eating the nutritious pine seeds and how they managed to get them out of the cones. The culprit proved to be the versatile and athletic black rat, (*Rattus rattus*), and the technique was to bite each cone scale off at its base, in sequence from base to tip following the spiral growth pattern of the cone.

D

Urban black rats were found to lack the skill and were unable to learn it even if housed with experienced cone strippers. However, infants of urban mothers cross-fostered by stripper mothers acquired the skill, whereas in fants of stripper mothers fostered by an urban mother could not. Clearly the skill had to be learned from the mother. Further elegant experiments showed that naive adults could develop the skill if they were provided with cones from which the first complete spiral of scales had been removed; rather like our new photocopier which you can work out how to use once someone has shown you how to switch it on. In the case of rats, the youngsters take cones away from the mother when she is still feeding on them, allowing them to acquire the complete stripping skill.

E

A good example of adaptive bearing we might conclude, but let's see the economies. This was determined by measuring oxygen uptake of a rat stripping a cone in a metabolic chamber to calculate energetic cost and comparing it with the benefit of the pine seeds measured by calorimeter. The cost proved to be less than 10% of the energetic value of the cone. An acceptable profit margin.

F

A paper in 1996, *Animal Behaviour* by Bednekoff and Baida, provides a different view of the adaptiveness of social learning. It concerns the seed caching behaviour of Clark's Nutcracker (*Nucifraga columbiana*) and the Mexican Jay (*Aphelocoma ultramarina*). The former is a specialist, caching 30,000 or so seeds in scattered locations that it will recover over the months of winter; the Mexican Jay will also cache food but is much less dependent upon this than the Nutcracker. The two species also differ in their social structure: the Nutcracker being rather solitary while the Jay forages in social groups.

G

The experiment is to discover not just whether a bird can remember where it hid a seed but also if it can remember where it saw another bird hide a seed. The design is slightly comical with a cacher bird wandering about a room with lots of holes in the floor hiding food in some of the holes, while watched by an observer bird perched in a cage. Two days later, cachers and observers are tested for their discovery rate against an estimated random performance. In the role of cacher, not only the Nutcracker but also the less specialised Jay performed above chance; more surprisingly, however, jay obser vers were as successful as jay cachers whereas nutcracker observers did no better than chance. It seems that, whereas the Nutcracker is highly adapted at remembering where it hid its own seeds, the social living Mexican Jay is more adept at remembering, and so exploiting, the caches of others.

Questions 1-4

Reading Passage 1 has seven paragraphs **A-G**. Which paragraph contains the following information? Write the correct letter **A-G** in boxes **1-4** on your answer sheet.

- 1 A comparison between rats' learning and human learning
- 2 A reference to the earliest study in animal learning
- 3 The discovery of who stripped the pine cone
- 4 A description of a cost-effectiveness experiment

Questions 5-8

Do the following statements agree with the information given in Reading Passage 1? In boxes **5-8** 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

- 5 The field trip to Israel was to investigate how black rats learn to strip pine cones.
- 6 The pine cones were stripped from bottom to top by black rats.
- 7 It can be learned from other relevant experiences to use a photocopier.
- 8 Stripping the pine cones is an instinct of the black rats.

Questions 9-13

Complete the summary below using words from the box.

Write your answers in boxes **9-13** on your answer sheet.

While the Nutcracker is more able to cache seeds, the Jay relies

9.....on caching food and is thus less specialised in this ability, but more 10

To study their behaviour of caching and finding their caches, an experiment was designed and carried out to test these two birds for their ability to remember where they hid the seeds. In the experiment, the cacher bird hid seeds in the ground while the other 11 As a result, the Nutcracker and the Mexican Jay showed different performance in the role of 12 at finding the seeds - the observing 13 didn't do as well as its counterpart.

less	social	remembered	nutcracker
more	catcher	watched	solitary
observer	Jay		

READING PASSAGE 2

You should spend about 20 minutes on **Questions 14-26**, which are based on Reading Passage 2 below.

A New Ice Age

William Curry is a serious, sober climate scientist, not an art critic. But he has spent a lot of time perusing Emanuel Gottlieb Leutze's famous painting "George Washington Crossing the Delaware", which depicts a boatload of colonial American soldiers making their way to attack English and Hessian troops the day after Christmas in 1776. "Most people think these other guys in the boat are rowing, but they are actually pushing the ice away," says Curry, tapping his finger on a reproduction of the painting. Sure enough, the lead oarsman is bashing the frozen river with his boot. "I grew up in Philadelphia. The place in this painting is 30 minutes away by car. I can tell you, this kind of thing just doesn't happen anymore."

But it may again soon. And ice-choked scenes, similar to those immortalised by the 16th-century Flemish painter Pieter Brueghel the Elder, may also return to Europe. His works, including the 1565

masterpiece "Hunters in the Snow", make the now temperate European landscapes look more like Lapland. Such frigid settings were commonplace during a period dating roughly from 1300 to 1850 because much of North America and Europe was in the throes of a little ice age. And now there is mounting evidence that the chill could return. A growing number of scientists believe conditions are ripe for another prolonged cool down, or small ice age. While no one is predicting a brutal ice sheet like the one that covered the Northern Hemisphere with glaciers about 12,000 years ago, the next cooling trend could drop average temperatures 5 degrees Fahrenheit over much of the United States and 10 degrees in the Northeast, northern Europe, and northern Asia.

"It could happen in 10 years," says Terrence Joyce, who chairs the Woods Hole Physical Oceanography Department. "Once it does, it can take hundreds of years to reverse." And he is alarmed that Americans have yet to take the threat seriously.

A drop of 5 to 10 degrees entails much more than simply bumping up the thermo stat and carrying on. Both economically and ecologically, such quick, persistent chilling could have devastating consequences. A 2002 report titled

"Abrupt Climate Change: Inevitable Surprises", produced by the National Academy of Sciences, pegged the cost from agricultural losses alone at \$100 billion to \$250 billion while also predicting that damage to ecologies could be vast and incalculable. A grim sampler: disappearing forests, increased housing expenses, dwindling fresh water, lower crop yields, and accelerated species extinctions.

The reason for such huge effects is simple. A quick climate change wreaks far more disruption than a slow one. People, animals, plants, and the economies that depend on them are like rivers; says the report: "For example, high water in a river will pose few problems until the water runs over the bank, after which levees can be breached and massive flooding can occur. Many biological processes undergo shifts at particular thresholds of temperature and precipitation."

Political changes since the last ice age could make survival far more difficult for the world's poor. During previous cooling periods, whole tribes simply picked up and moved south, but that option doesn't work in the modern, tense world of closed borders. "To the extent that abrupt climate change may cause rapid and extensive changes of fortune for those who live off the land, the inability to migrate may remove one of the major safety nets for distressed people," says the report.

But first things first. Isn't the earth actually warming? Indeed it is, says Joyce. 'In his cluttered office, full of soft light from the foggy Cape Cod morning, he explains how such warming could actually be the surprising culprit of the next mini ice age. The paradox is a result of the appearance over the past 30 years in the North Atlantic of huge rivers of fresh water the equivalent of a 10 foot thick layer mixed into the salty sea. No one is certain where the fresh torrents are coming from, but a prime suspect is melting Arctic ice, caused by a buildup of carbon dioxide in the atmosphere that traps solar energy.

The freshwater trend is major news in ocean science circles. Bob Dickson, a British oceanographer who sounded an alarm at a February conference in Honolulu, has termed the drop in salinity and temperature in the Labrador Sea a body of water between northeastern Canada and Greenland that adjoins the Atlantic "arguably the largest full-depth changes observed in the modern instrumental oceanographic record".

The trend could cause a little ice age by subverting the northern penetration of Gulf Stream waters. Normally, the Gulf Stream, laden with heat soaked up in the tropics, meanders up the east coasts of the United States and Canada. As it flows northward, the stream surrenders heat to the air. Because the prevailing North Atlantic winds blow eastward, a lot of the heat wafts to Europe. That's why many scientists believe winter temperatures on the Continent are as much as 36 degrees Fahrenheit warmer than those in North America at the same latitude. Frigid Boston, for example, lies at almost precisely the same latitude as balmy Rome. And some scientists say the heat also warms Americans and Canadians. "It's a real mistake to think of this solely as a European phenomenon," says Joyce.

Having given up its heat to the air, the now cooler water becomes denser and sinks into the North Atlantic by a mile or more in a process oceanographers call thermohaline circulation. This massive column of cascading cold is the main engine powering a deep water current called the Great Ocean Conveyor that snakes through all the world's oceans. But as the North Atlantic fills with fresh water, it grows less dense, making the waters carried northward by the Gulf Stream less able to sink. The new mass of relatively fresh water sits on top of the ocean like a big thermal blanket, threatening the thermohaline circulation.

That in turn could make the Gulf Stream slow or veer southward. At some point, the whole system could simply shut down, and do so quickly. "There is increasing evidence that we are getting closer to a transition point, from which we can jump to a new state."

Questions 14-17

Choose the correct letter **A, B, C** or **D**. Write your answers in boxes **14-17** on your answer sheet.

14 The writer uses paintings in the first paragraph to illustrate

- A possible future climate change.
- B climate change of the last two centuries.
- C the river doesn't freeze in winter anymore.
- D how George Washington led his troops across the river.

15 Which of the following do scientists believe to be possible?

- A The temperature may drop over much of the Northern Hemisphere.
- B It will be colder than 12,000 years ago.
- C The entire Northern Hemisphere will be covered in ice.
- D Europe will look more like Lapland.

16 Why is it difficult for the poor to survive the next ice age?

- A People don't live in tribes anymore.
- B Politics are changing too fast today.
- C Abrupt climate change causes people to live off their land.
- D Migration has become impossible because of closed borders.

17 Why is continental Europe much warmer than North America in winter?

- A Wind blows most of the heat of tropical currents to Europe.
- B Europe and North America are at different latitudes.
- C The Gulf Stream has stopped yielding heat to the air.
- D The Gulf Stream moves north along the east coast of North America.

Questions 18-22

Look at the following statements (Questions **18-22**) and the list of people in the box below. Match each statement with the correct person **A-D**.

Write the appropriate letter **A-D** in boxes **18-22** on your answer sheet.

NB You may use any letter **more than once**.

- 18 Most Americans are not prepared for the next ice age.
- 19 The result of abrupt climate change is catastrophic.
- 20 The world is not as cold as it used to be.
- 21 Global warming is closely connected to the ice age.
- 22 Alerted people to the change of ocean water in a conference

List of People

- A** William Curry
- B** Terrence Joyce
- C** Bob Dickson
- D** National Academy of Sciences

Questions 23-26

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

- 23
 - 24
 - 25
 - 26
-

READING PASSAGE 3

You should spend about 20 minutes on **Questions 27-40**, which are based on Reading Passage 3 below.

The Fruit Book

It's not every scientist who writes books for people who can't read. And how many scientists want their books to look as dog eared as possible? But Patricia Shanley, an ethnobotanist, wanted to give something back. After the poorest people of the Amazon allowed her to study their land and its ecology, she turned her research findings into a picture book that tells the local people how to get a good return on their trees without succumbing to the lure of a quick buck from a logging company. It has proved a big success.

A

The book is called *Fruit Trees and Useful Plants in the Lives of Amazonians*, but is better known simply as the "fruit book". The second edition was produced at the request of politicians in western Amazonia. Its blend of hard science and local knowledge on the use and trade of 35 native forest species has been so well received (and well used) that no less a dignitary than Brazil's environment minister, Marina Silva, has written the foreword. "There is nothing else like the Shanley book," says Adalberto Verrisimo, director of the Institute of People and the Environment of the Amazon. "It gives science back to the poor, to the people who really need it."

B

Shanley's work on the book began a decade ago, with a plea for help from the Rural Workers' Union of Paragominas, a Brazilian town whose prosperity is based on exploitation of timber. The union realised that logging companies would soon be knocking on the doors of the caboclos, peasant farmers living on the Rio Capim, an Amazon tributary in the Brazilian state of Para. Isolated and illiterate, the caboclos would have little concept of the true value of their trees; communities downstream had already sold off large blocks of forest for a pittance. "What they wanted to know was how valuable the forests were," recalls Shanley, then a researcher in the area for the Massachusetts based Woods Hole Research Centre.

C

The Rural Workers' Union wanted to know whether harvesting wild fruits would make economic sense in the Rio Capim. "There was a lot of interest in trading non-timber forest products (NTFPs)," Shanley says. At the time, environmental groups and green minded businesses were promoting the idea. This was the view presented in a seminal paper, *Valuation of an Amazonian Rainforest*, published in *Nature* in 1989. The researchers had calculated that revenues from the sale of fruits could far exceed those from a one off sale of trees to loggers. "The union was keen to discover whether it made more sense conserving the forest for subsistence use and the possible sale of fruit, game and medicinal plants, than selling trees for timber," says Shanley. Whether it would work for the caboclos was far from clear.

D

Although Shanley had been invited to work in the Rio Capim, some caboclos were suspicious. "When Patricia asked if she could study my forest," says Joao Fernando Moreira Brito, "my neighbours said she was a foreigner who'd come to rob me of my trees." In the end, Moreira Brito, or Manguiera as he is known, welcomed Shanley and worked on her study. His land, an hour's walk from the Rio Capim, is almost entirely covered with primary forest. A study of this and other tracts of forest selected by the communities enabled Shanley to identify three trees, found throughout the Amazon, whose fruit was much favoured by the caboclos: bacuri (*Platonia insignis*), uxi (*Endopleura uchi*) and piquia (*Cayocas*

villosum). The caboclos used their fruits, extracted oils, and knew what sort of wildlife they attracted. But, in the face of aggressive tactics from the logging companies, they had no measure of the trees' financial worth. The only way to find out, Shanley decided, was to start from scratch with a scientific study. "From a scientific point of view, hardly anything was known about these trees," she says. But six years of field research yielded a mass of data on their flowering and fruiting behaviour. During 1993 and 1994, 30 families weighed everything they used from the forest - game, fruit, fibre, medicinal plants and documented its source.

E

After three logging sales and a major fire in 1997, the researchers were also able to study the ecosystem's reaction to logging and disturbance. They carried out a similar, though less exhaustive, study in 1999, this time with 15 families. The changes were striking. Average annual household consumption of forest fruit had fallen from 89 to 28 kilogrammes between 1993 and 1999. "What we found," says Shanley, "was that fruit collection could coexist with a certain amount of logging, but after the forest fire, it dropped dramatically." Over the same period, fibre use also dropped from around 20 to 4 kilogrammes. The fire and logging also changed the nature of the caboclo diet. In 1993 most households ate game two or three times a month. By 1999 some were fortunate if they ate game more than two or three times a year.

F

The loss of certain species of tree was especially significant. Shanley's team persuaded local hunters to weigh their catch, noting the trees under which the animals were caught. Over the year, they trapped five species of game averaging 232 kilogrammes under piquia trees. Under copaiba, they caught just two species averaging 63 kilogrammes; and under uxi, four species weighing 38 kilogrammes. At last, the team was getting a handle on which trees were worth keeping, and which could reasonably be sold. "This showed that selling piquia trees to loggers for a few dollars made little sense," explains Shanley. "Their local value lies in providing a prized fruit, as well as flowers which attract more game than any other species."

G

As a result of these studies, Shanley had to tell the Rural Workers' Union of Paragominas that the Nature thesis could not be applied wholesale to their community harvesting NTFPs would not always yield more than timber sales. Fruiting patterns of trees such as uxi were unpredictable, for example. In 1994, one household collected 3,654 uxi fruits; the following year, none at all.

H

This is not to say that wild fruit trees were unimportant. On the contrary, argues Shanley, they are critical for subsistence, something that is often ignored in much of the current research on NTFPs, which tends to focus on their commercial potential. Geography was another factor preventing the Rio Capim caboclos from establishing a serious trade in wild fruit: villagers in remote areas could not compete with communities collecting NTFPs close to urban markets, although they could sell them to passing river boats.

I

But Shanley and her colleagues decided to do more than just report their results to the union. Together with two of her research colleagues, Shanley wrote the fruit book. This, the Bible and a publication on medicinal plants coauthored by Shanley and designed for people with minimal literacy skills are about the only books you will see along this stretch of the Rio Capim. The first print ran to only 3,000 copies, but the fruit book has been remarkably influential, and is used by colleges, peasant unions, industries and the caboclos themselves. Its success is largely due to the fact that people with poor literacy skills can understand much of the information it contains about the non timber forest products, thanks to its

illustrations, anecdotes, stories and songs. "The book doesn't tell people what to do," says Shanley, "but it does provide them with choices." The caboclos who have used the book now have a much better understanding of which trees to sell to the loggers, and which to protect.

Questions 27-32

Reading Passage 3 has nine paragraphs A-I.

Which paragraph contains the following information?

Write the correct letter **A-I** in boxes **27-32** on your answer sheet.

- 27 A description of Shanley's initial data collection
- 28 Why a government official also contributes to the book
- 29 Reasons why the community asked Shanley to conduct the research
- 30 Reference to the starting point of her research
- 31 Two factors that alter food consumption patterns
- 32 Why the book is successful

Questions 33-40

Complete the summary below.

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

Write your answers in boxes **33-40** on your answer sheet.

Forest fire has caused local villagers to consume less:

33

34

Game

There is the least amount of game hunted under 35 yield is also 36

Thus, it is more reasonable to keep 37 All the trees can also be used for 38 besides selling them to loggers. But this is often ignored, because most researches usually focus on the 39 of the trees.

The purpose of the book:

To give information about 40

Reading Practice Test 4

READING PASSAGE 1

You should spend about 20 minutes on **Questions 1-13**, which are based on Reading Passage 1 below.

The Mozart Effect

A

Music has been used for centuries to heal the body. In the Ebers Papyrus (one of the earliest medical documents, circa 1550 BC), it was recorded that physicians chanted to heal the sick (Castleman, 1994). In various cultures, we have observed singing as part of healing rituals. In the world of Western medicine, however, using music in medicine lost popularity until the introduction of the radio. Researchers then started to notice that listening to music could have significant physical effects. Therapists noticed music could help calm anxiety, and researchers saw that listening to music, could cause a drop in blood pressure. In addition to these two areas, music has been used with cancer chemotherapy to reduce nausea, during surgery to reduce stress hormone production, during childbirth, and in stroke recovery (Castleman, 1994 and Westley, 1998). It has been shown to decrease pain as well as enhance the effectiveness of the immune system. In Japan, compilations of music are used as medication of sorts. For example, if you want to cure a headache or migraine, the album suggested is Mendelssohn's "Spring Song", Dvorak's "Humoresque", or part of George Gershwin's "An American in Paris" (Campbell, 1998). Music is also being used to assist in learning, in a phenomenon called the Mozart Effect.

B

Frances H. Rauscher, PhD, first demonstrated the correlation between music and learning in an experiment in 1993. His experiment indicated that a 10 minute dose of Mozart could temporarily boost intelligence. Groups of students were given intelligence tests after listening to silence, relaxation tapes, or Mozart's "Sonata for Two Pianos in D Major" for a short time. He found that after silence, the average IQ score was 110, and after the relaxation tapes, the score rose a point. After listening to Mozart's music, however, the score jumped to 119 (Westley, 1998). Even students who did not like the music still had an increased score in the IQ test. Rauscher hypothesised that "listening to complex, non-repetitive music, like Mozart's, may stimulate neural pathways that are important in thinking" (Castleman, 1994).

C

The same experiment was repeated on rats by Rauscher and Hong Hua Li from Stanford. Rats also demonstrated enhancement in their intelligence performance. These new studies indicate that rats that were exposed to Mozart's showed "increased gene expression of BDNF (a neural growth factor), CREB (a learning and memory compound), and Synapsin I (a synaptic growth protein)" in the brain's hippocampus, compared with rats in the control group, which heard only white noise (e.g. the whooshing sound of a V radio tuned between stations).

D

How exactly does the Mozart Effect work? Researchers are still trying to determine the actual mechanisms for the formation of these enhanced learning pathways. Neuroscientists suspect that music can actually help build and strengthen connections between neurons in the cerebral cortex in a process similar to what occurs in brain development despite its type. When a baby is born, certain connections have already been made like connections for heartbeat and breathing. As new information is learned and motor skills develop, new neural connections are formed. Neurons that are

not used will eventually die while those used repeatedly will form strong connections. Although a large number of these neural connections require experience, they must also occur within a certain time frame. For example, a child born with cataracts cannot develop connections within the visual cortex. If the cataracts are removed by surgery right away, the child's vision develops normally. However, after the age of 2, if the cataracts are removed, the child will remain blind because those pathways cannot establish themselves.

E

Music seems to work in the same way. In October of 1997, researchers at the University of Konstanz in Germany found that music actually rewires neural circuits (Begley, 1996). Although some of these circuits are formed for physical skills needed to play an instrument, just listening to music strengthens connections used in higher-order thinking. Listening to music can then be thought of as "exercise" for the brain, improving concentration and enhancing intuition.

F

If you're a little sceptical about the claims made by supporters of the Mozart Effect, you're not alone. Many people credit the advanced learning of some children who take music lessons to other personality traits, such as motivation and persistence, which are required in all types of learning. There have also been claims of that influencing the results of some experiments.

G

Furthermore, many people are critical of the role the media had in turning an isolated study into a trend for parents and music educators. After the Mozart Effect was published to the public, the sales of Mozart CDs stayed on the top of the hit list for three weeks. In an article by Michael Linton, he wrote that the research that began this phenomenon (the study by researchers at the University of California, Irvine) showed only a temporary boost in IQ, which was not significant enough to even last throughout the course of the experiment. Using music to influence intelligence was used in Confucian civilisation and Plato alluded to Pythagorean music when he described its ideal state in *The Republic*. In both of these examples, music did not cause any overwhelming changes, and the theory eventually died out. Linton also asks, "If Mozart's music were able to improve health, why was Mozart himself so frequently sick? If listening to Mozart's music increases intelligence and encourages spirituality, why aren't the world's smartest and most spiritual people Mozart specialists?" Linton raises an interesting point, if the Mozart Effect causes such significant changes, why isn't there more documented evidence?

H

The "trendiness" of the Mozart Effect may have died out somewhat, but there are still strong supporters (and opponents) of the claims made in 1993. Since that initial experiment, there has not been a surge of supporting evidence. However, many parents, after playing classical music while pregnant or when their children are young, will swear by the Mozart Effect. A classmate of mine once told me that listening to classical music while studying will help with memorisation. If we approach this controversy from a scientific aspect, although there has been some evidence that music does increase brain activity, actual improvements in learning and memory have not been adequately demonstrated.

Questions 1-5

Reading Passage 1 has eight paragraphs **A-H**. Which paragraph contains the following information?

Write the correct letter **A-H** in boxes **1-5** on your answer sheet.

- 1 A description of how music affects the brain development of infants
- 2 Public's first reaction to the discovery of the Mozart Effect

- 3 The description of Rauscher's original experiment
- 4 The description of using music for healing in other countries
- 5 Other qualities needed in all learning

Questions 6-8

Complete the summary below.

Choose **NO MORE THAN ONE WORD** from the passage for each answer.

Write your answers in boxes **6-8** on your answer sheet.

During the experiment conducted by Frances Rauscher, subjects were exposed to the music for a 6 period of time before they were tested. And Rauscher believes the enhancement in their performance is related to the 7, non-repetitive nature of Mozart's music. Later, a similar experiment was also repeated on 8

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 is true

FALSE if the statement is false

NOT GIVEN if the information is not given in the passage

- 9 All kinds of music can enhance one's brain performance to somewhat extent.
- 10 There is no neural connection made when a baby is born.
- 11 There are very few who question the Mozart Effect.
- 12 Michael Linton conducted extensive research on Mozart's life.
- 13 There is not enough evidence in support of the Mozart Effect today.

READING PASSAGE 2

You should spend about 20 minutes on **Questions 14-26**, which are based on Reading Passage 2 below.

The Ant and the Mandarin

In 1476, the farmers of Berne in Switzerland decided there was only one way to rid their fields of the cutworms attacking their crops. They took the pests to court. The worms were tried, found guilty and excommunicated by the arch bishop. In China, farmers had a more practical approach to pest control. Rather than relying on divine intervention, they put their faith in frogs, ducks and ants. Frogs and ducks were encouraged to snap up the pests in the paddies and the occasional plague of locusts. But the notion of biological control began with an ant. More specifically, it started with the predatory yellow citrus ant *Oecophylla smaragdina*, which has been polishing off pests in the orange groves of southern China for at least 1,700 years. The yellow citrus ant is a type of weaver ant, which binds leaves and twigs with silk to form a neat, tentlike nest. In the beginning, farmers made do with the odd ants' nests here and there. But it wasn't long before growing demand led to the development of a thriving trade in nests and a new type of agriculture ant farming.

For an insect that bites, the yellow citrus ant is remarkably popular. Even by ant standards, *Oecophylla smaragdina* is a fearsome predator. It's big, runs fast and has a powerful nip painful to humans but lethal to many of the insects that plague the orange groves of Guangdong and Guangxi in southern China. And for at least 17 centuries, Chinese orange growers have harnessed these six legged killing

machines to keep their fruit groves healthy and productive.

Citrus fruits evolved in the Far East and the Chinese discovered the delights of their flesh early on. As the ancestral home of oranges, lemons and pomelos, China also has the greatest diversity of citrus pests. And the trees that produce the sweetest fruits, the mandarins or kan attract a host of plant-eating insects, from black ants and sap-sucking mealy bugs to leaf-devouring caterpillars. With so many enemies, fruit growers clearly had to have some way of protecting their orchards.

The West did not discover the Chinese orange growers' secret weapon until the early 20th century. At the time, Florida was suffering an epidemic of citrus canker and in 1915 Walter Swingle, a plant physiologist working for the US Department of Agriculture, was sent to China in search of varieties of orange that were resistant to the disease. Swingle spent some time studying the citrus orchards around Guangzhou, and there he came across the story of the cultivated ant. These ants, he was told, were "grown" by the people of a small village nearby who sold them to the orange growers by the nestful.

The earliest report of citrus ants at work among the orange trees appeared in a book on tropical and subtropical botany written by Hsi Han in AD 304. "The people of Chiao Chih sell in their markets ants in bags of rush matting. The nests are like silk. The bags are all attached to twigs and leaves which, with the ants inside the nests, are for sale. The ants are reddish yellow in colour, bigger than ordinary ants. In the south, if the kan trees do not have this kind of ant, the fruits will all be damaged by many harmful insects, and not a single fruit will be perfect."

Initially, farmers relied on nests which they collected from the wild or bought in the market where trade in nests was brisk. "It is said that in the south orange trees which are free of ants will have wormy fruits. Therefore, people race to buy nests for their orange trees," wrote Liu Hsun in *Strange Things Noted in the South* in about 890.

The business quickly became more sophisticated. From the 10th century, country people began to trap ants in artificial nests baited with fat. "Fruit growing families buy these ants from vendors who make a business of collecting and selling such creatures," wrote Chuang Chi-Yu in 1130. "They trap them by filling hogs' or sheep's bladders with fat and placing them with the cavities open next to the ants' nests. They wait until the ants have migrated into the bladders and take them away. This is known as 'rearing orange ants'." Farmers attached the bladders to their trees, and in time the ants spread to other trees and built new nests.

By the 17th century, growers were building bamboo walkways between their trees to speed the colonisation of their orchards. The ants ran along these narrow bridges from one tree to another and established nests "by the hundreds of thousands".

Did it work? The orange growers clearly thought so. One authority, Chhii Ta Chun, writing in 1700, stressed how important it was to keep the fruit trees free of insect pests, especially caterpillars. "It is essential to eliminate them so that the trees are not injured. But hand labour is not nearly as efficient as ant power..."

Swingle was just as impressed. Yet despite his reports, many Western biologists were sceptical. In the

West, the idea of using one insect to destroy another was new and highly controversial. The first breakthrough had come in 1888, when the infant orange industry in California had been saved from extinction by the Australian vedalia beetle. This beetle was the only thing that had made any inroads into the explosion of cottony cushion scale that was threatening to destroy the state's citrus crops. But, as Swingle now knew, California's "first" was nothing of the sort. The Chinese had been expert in biocontrol for many centuries.

The long tradition of ants in the Chinese orchards only began to waver in the 1950s and 1960s with the introduction of powerful organic insecticides. Although most fruit growers switched to chemicals, a few hung onto their ants. Those who abandoned ants in favour of chemicals quickly became disillusioned. As costs soared and pests began to develop resistance to the chemicals, growers began to revive the old ant patrols in the late 1960s. They had good reason to have faith in their insect workforce. Research in the early 1960s showed that as long as there were enough ants in the trees, they did an excellent job of dispatching some pests mainly the larger insects and had modest success against others. Trees with yellow ants produced almost 20 per cent more healthy leaves than those without. More recent trials have shown that these trees yield just as big a crop as those protected by expensive chemical sprays.

One apparent drawback of using ants - and one of the main reasons for the early scepticism by Western scientists was that citrus ants do nothing to control mealy bugs, waxy coated scale insects which can do considerable damage to fruit trees. In fact, the ants protect mealy bugs in exchange for the sweet honey dew they secrete. The orange growers always denied this was a problem but Western scientists thought they knew better.

Research in the 1980s suggests that the growers were right all along. Where mealy bugs proliferate under the ants' protection, they are usually heavily parasitised and this limits the harm they can do.

Orange growers who rely on carnivorous ants rather than poisonous chemicals maintain a better balance of species in their orchards. While the ants deal with the bigger insect pests, other predatory species keep down the numbers of smaller pests such as scale insects and aphids. In the long run, ants do a lot less damage than chemicals and they're certainly more effective than excommunication.

Questions 14-18

Look at the following events (Questions 14-18) and the list of dates below. Match each event with the correct time **A-G**. Write the correct letter **A-G** in boxes **14-18** on your answer sheet.

- 14 The first description of citrus ants is traded in the marketplace.
- 15 Swingle came to Asia for research.
- 16 The first record of one insect is used to tackle other insects in the western world.
- 17 Chinese fruit growers started to use pesticides in place of citrus ants.
- 18 Some Chinese farmers returned to the traditional biomet method

List of Dates

- A 1888
- B AD 890
- C AD 304
- D 1950s
- E 1960s

F 1915

G 1130

Questions 19-26

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

In boxes **19-26** 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 China has more citrus pests than any other country in the world.

20 Swingle came to China to search for an insect to bring back to the US.

21 Many people were very impressed by Swingle's discovery.

22 Chinese farmers found that pesticides became increasingly expensive.

23 Some Chinese farmers abandoned the use of pesticide.

24 Trees with ants had more leaves fall than those without.

25 Fields using ants yield as large a crop as fields using chemical pesticides.

26 Citrus ants often cause considerable damage to the bio-environment of the orchards.

READING PASSAGE 3

You should spend about 20 minutes on **Questions 27-40**, which are based on Reading Passage 3 below.

Music: Language We All Speak

Section A

Music is one of the human species' relatively few universal abilities. Without formal training, any individual, from Stone Age tribesman to suburban teenager, has the ability to recognise music and, in some fashion, to make it. Why this should be so is a mystery. After all, music isn't necessary for getting through the day, and if it aids in reproduction, it does so only in highly indirect ways. Language, by contrast, is also everywhere but for reasons that are more obvious. With language, you and the members of your tribe can organise a migration across Africa, build reed boats and cross the seas, and communicate at night even when you can't see each other. Modern culture, in all its technological extravagance, springs directly from the human talent for manipulating symbols and syntax.

Scientists have always been intrigued by the connection between music and language. Yet over the years, words and melody have acquired a vastly different status in the lab and the seminar room. While language has long been considered essential to unlocking the mechanisms of human intelligence, music is generally treated as an evolutionary frippery mere "auditory cheesecake", as the Harvard cognitive scientist Steven Pinker puts it.

Section B

But thanks to a decade-long wave of neuroscience research, that tune is changing. A flurry of recent publications suggests that language and music may equally be able to tell us who we are and where we're from not just emotionally, but biologically. In July, the journal *Nature Neuroscience* devoted a special issue to the topic. And in an article in the 6 August issue of the *Journal of Neuroscience*, David Schwartz, Catherine Howe, and Dale Purves of Duke University argued that the sounds of music and the sounds of language are intricately connected.

To grasp the originality of this idea, it's necessary to realise two things about how music has traditionally been understood. First, musicologists have long emphasized that while each culture stamps a special identity onto its music, music itself has some universal qualities. For example, in virtually all cultures, sound is divided into some or all of the 12 intervals that make up the chromatic scale that is, the scale represented by the keys on a piano. For centuries, observers have attributed this preference for certain combinations of tones to the mathematical properties of sound itself.

Some 2,500 years ago, Pythagoras was the first to note a direct relationship between the harmoniousness of a tone combination and the physical dimensions of the object that produced it. For example, a plucked string will always play an octave lower than a similar string half its size, and a fifth lower than a similar string two thirds its length. This link between simple ratios and harmony has influenced music theory ever since.

Section C

This music is math idea is often accompanied by the notion that music, formally speaking at least, exists apart from the world in which it was created. Writing recently in *The New York Review of Books*, pianist and critic Charles Rosen discussed the long-standing notion that while painting and sculpture reproduce at least some aspects of the natural world, and writing describes thoughts and feelings we are all familiar with, music is entirely abstracted from the world in which we live. Neither idea is right, according to David Schwartz and his colleagues. Human musical preferences are fundamentally shaped not by elegant algorithms or ratios but by the messy sounds of real life, and of speech in particular which in turn is shaped by our evolutionary heritage. "The explanation of music, like the explanation of any product of the mind, must be rooted in biology, not in numbers per se," says Schwartz.

Schwartz, Howe, and Purves analyzed a vast selection of speech sounds from a variety of languages to reveal the underlying patterns common to all utterances. In order to focus only on the raw sounds, they discarded all theories about speech and meaning, and sliced sentences into random bites. Using a database of over 100,000 brief segments of speech, they noted which frequency had the greatest emphasis in each sound. The resulting set of frequencies, they discovered, corresponded closely to the chromatic scale. In short, the building blocks of music are to be found in speech.

Far from being abstract, music presents a strange analogue to the patterns created by the sounds of speech. "Music, like visual arts, is rooted in our experience of the natural world," says Schwartz. "It emulates our sound environment in the way that visual arts emulate the visual environment." In music we hear the echo of our basic sound making instrument the vocal tract. The explanation for human music is simpler still than Pythagoras's mathematical equations: We like the sounds that are familiar to us - specifically, we like the sounds that remind us of us.

This brings up some chicken or egg evolutionary questions. It may be that music imitates speech directly, the researchers say, in which case it would seem that language evolved first. It's also conceivable that music came first and language is in effect an imitation of song that in everyday speech we hit the musical notes we especially like. Alternately, it may be that music imitates the general products of the human sound making system, which just happens to be mostly speech. "We can't know this," says Schwartz. "What we do know is that they both come from the same system, and it is this that shapes our preferences."

Section D

Schwartz's study also casts light on the long running question of whether animals understand or appreciate music. Despite the apparent abundance of "music" in the natural world birdsong, whalesong, wolf howls, synchronised chimpanzee hooting previous studies have found that many laboratory animals don't show a great affinity for the human variety of music making.

Marc Hauser and Josh McDermott of Harvard argued in the July issue of Nature Neuroscience that animals don't create or perceive music the way we do. The fact that laboratory monkeys can show recognition of human tunes is evidence, they say, of shared general features of the auditory system, not any specific chimpanzee musical ability. As for birds, those most musical beasts, they generally recognise their own tunes a narrow repertoire but don't generate novel melodies like we do. There are no avian Mozarts.

But what's been played to animals, Schwartz notes, is human music. If animals evolve preferences for sound as we do based upon the soundscape in which they live then their "music" would be fundamentally different from ours. In the same way our scales derive from human utterances, a cat's idea of a good tune would derive from yowls and meows. To demonstrate that animals don't appreciate sound the way we do, we'd need evidence that they don't respond to "music" constructed from their own sound environment.

Section E

No matter how the connection between language and music is parsed, what is apparent is that our sense of music, even our love for it, is as deeply rooted in our biology and in our brains as language is. This is most obvious with babies, says Sandra Trehub at the University of Toronto, who also published a paper in the Nature Neuroscience special issue.

For babies, music and speech are on a continuum. Mothers use musical speech to "regulate infants' emotional states", Trehub says. Regardless of what language they speak, the voice all mothers use with babies is the same: "something between speech and song". This kind of communication "puts the baby in a trancelike state, which may proceed to sleep or extended periods of rapture". So if the babies of the world could understand the latest research on language and music, they probably wouldn't be very surprised. The upshot, says Trehub, is that music may be even more of a necessity than we realise.

Questions 27-31

Reading Passage 3 has five sections **A-E**.

Choose the correct heading for each section from the list of headings below.

Write the correct number **i-viii** in boxes **27-31** on your answer sheet.

- 27 Section A
- 28 Section B
- 29 Section C
- 30 Section D
- 31 Section E

List of Headings

- i** Communication in music with animals
- ii** New discoveries on animal music
- iii** Music and language contrasted
- iv** Current research on music
- v** Music is beneficial for infants.
- vi** Music transcends cultures.
- vii** Look back at some of the historical theories

viii Are we genetically designed for music?

Questions 32-38

Look at the following people (Questions 32-38) and the list of statements below.

Match each person with the correct statement.

Write the correct letter **A-G** in boxes **32-38** on your answer sheet.

- 32 Steven Pinker
- 33 Musicologists
- 34 Greek philosopher Pythagoras
- 35 Schwartz, Howe, and Purves
- 36 Marc Hauser and Josh McDermott
- 37 Charles Rosen
- 38 Sandra Trehub

List of Statements

- A** Music exists outside of the world it is created in.
- B** Music has a universal character despite cultural influences on it.
- C** Music is a necessity for humans.
- D** Music preference is related to the surrounding influences.
- E** He discovered the mathematical basis of music.
- F** Music doesn't enjoy the same status of research interest as language.
- G** Humans and monkeys have similar traits in perceiving sound.

Questions 39-40

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

Write your answers in boxes **39-40** on your answer sheet.

- 39 Why was the study of animal music inconclusive?
 - A** Animals don't have the same auditory system as humans.
 - B** Tests on animal music are limited.
 - C** Animals can't make up new tunes.
 - D** There aren't enough tests on a wide range of animals.

- 40 What is the main theme of this passage?
 - A** Language and learning
 - B** The evolution of music
 - C** The role of music in human society
 - D** Music for animals

Reading Practice Test 5

READING PASSAGE 1

You should spend about 20 minutes on **Questions 1-13**, which are based on Reading Passage 1 below.

A Wonder 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.

A

Every year, during the rainy season, the mountain gorillas of Central Africa migrate 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 there are at almost 150 types of plant, as well as various insects and other invertebrates, bamboo accounts for up to 90 percent of their diet at this time of year. 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.

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 recognized 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.

C

Bamboo is a type of grass. It comes in a wide variety of forms, ranging in height from 30 centimeters to more than 40 meters. It is also the world's fastest-growing woody plant; some species can grow more than a meter 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 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.

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 percent 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 \$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."

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 anywhere for forest plants such as bamboo to grow if you create a cattle pasture."

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. Townsend, 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 1-7

Reading Passage I has six sections **A-F**. Which section contains the following information ?

Write the correct letter **A-F** in boxes **1-7** on your answer sheet

NB You may use any letter **more than once**

- 1 Comparison of bamboo with other plant species
- 2 Commercial products of bamboo
- 3 Limited extent of existing research
- 4 A human development that destroyed large areas of bamboo
- 5 How bamboos are put to a variety of uses
- 6 An explanation of how bamboo can help the survival of a range of plants
- 7 The methods used to study bamboo

Questions 8-11

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 **8-11** 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

- 8 Destroying bamboo jeopardizes to wildlife.
- 9 People have very confined knowledge of bamboo.
- 10 Some people do not think that bamboo is endangered.
- 11 Bamboo has loads of commercial potentials.

Questions 12-13

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

What environmental problem does the unique root system of bamboo prevent?

12

Which bamboo product is experiencing market expansion? 13

READING PASSAGE 2

You should spend about 20 minutes on **Questions 14-26**, which are based on Reading Passage 2 below.

Children's Literature

Stories and poems aimed at children have an exceedingly long history : lullabies, for example, were sung in Roman times, and a few nursery games and rhymes are almost as ancient. Yet so far as written-down literature is concerned, while there were stories in print before 1700 that children often seized on when they had the chance, such as translations of Aesop's fables, fairy stories and popular ballads and romances, these were not aimed at young people in particular. Since the only genuinely child-oriented literature at this time would have been a few instructional works to help with reading and general knowledge, plus the odd Puritanical tract as an aid to morality, the only course for keen child readers was to read adult literature. This still occurs today, especially with adult thrillers or romances that include more exciting, graphic detail than is normally found in the literature for younger readers.

By the middle of the 18th century there were enough eager child readers, and enough parents glad to

cater to this interest, for publishers to specialize in children's books whose first aim was pleasure rather than education or morality. In Britain, a London merchant named Thomas Boreham produced *Cajanus, The Swedish Giant* in 1742, while the more famous John Newbery published *A Little Pretty Pocket Book* in 1744. Its contents rhymes, stories, children's games plus a free gift ('A ball and a pincushion') in many ways anticipated the similar lucky dip contents of children's annuals this century. It is a tribute to Newbery's flair that he hit upon a winning formula quite so quickly, to be pirated almost immediately in America.

Such pleasing levity was not to last. Influenced by Rousseau, whose *Emile* (1762) decreed that all books for children save *Robinson Crusoe* were a dangerous diversion, contemporary critics saw to it that children's literature should be instructive and uplifting. Prominent among such voices was Mrs. Sarah Trimmer, whose magazine *The Guardian of Education* (1802) carried the first regular reviews of children's books. It was she who condemned fairy tales for their violence and general absurdity; her own stories, *Fabulous Histories* (1786) described talking animals who were always models of sense and decorum.

So the moral story for children was always threatened from within, given the way children have of drawing out entertainment from the sternest moralist. But the greatest blow to the improving children's book was to come from an unlikely source indeed: early 19th century interest in folklore. Both nursery rhymes, selected by James Orchard Halliwell for a folklore society in 1842, and collection of fairy stories by the scholarly Grimm brothers, swiftly translated into English in 1823, soon rocket to popularity with the young, quickly leading to new editions, each one more child centered than the last. From now on younger children could expect stories written for their particular interest and with the needs of their own limited experience of life kept well to the fore.

What eventually determined the reading of older children was often not the availability of special children's literature as such but access to books that contained characters, such as young people or animals, with whom they could more easily empathize, or action, such as exploring or fighting, that made few demands on adult maturity or understanding. The final apotheosis of literary childhood as something to be protected from unpleasant reality came with the arrival in the late 1930s of child-centered best sellers intent on entertainment at its most escapist. In Britain novelist such as Enid Blyton and Richmal Crompton described children who were always free to have the most unlikely adventures, secure in the knowledge that nothing bad could ever happen to them in the end. The fact that war broke out again during her books' greatest popularity fails to register at all in the self enclosed world inhabited by Enid Blyton's young characters. Reaction against such dream worlds was inevitable after World War II, coinciding with the growth of paperback sales, children's libraries and a new spirit of moral and social concern. Urged on by committed publishers and progressive librarians, writers slowly began to explore new areas of interest while also shifting the settings of their plots from the middle class world to which their chiefly adult patrons had always previously belonged.

Critical emphasis, during this development, has been divided. For some the most important task was to rid children's books of the social prejudice and exclusiveness no longer found acceptable. Others concentrated more on the positive achievements of contemporary children's literature. That writers of these works are now often recommended to the attentions of adult as well as child readers echoes the 19th century belief that children's literature can be shared by the generations, rather than being a defensive barrier between childhood and the necessary growth towards adult understanding.

Questions 14-18

Complete the table below. Choose **NO MORE THAN TWO WORDS** from Reading Passage 2 for each answer. Write your answers in boxes **14-18** on your answer sheet.

DATE	FEATURES	AIM	EXAMPLE
Before 1700	Not aimed at young children	Education and morality	Puritanical tract
By the middle of 18th century	Collection of 14..... and games	Read for pleasure	A Little Pretty Pocket Book (exported to 15
Early 19 century	Growing interest in 16	To be more children centered	Nursery rhymes and 17
Late 1930s	Stories of harm-free 18	Entertainment	Enid Blyton and Richarnal Crompton's novels

Questions 19-21

Look at the following people and the list of statements below. Match each person with the correct statement.

Write the correct letter **A-E** in boxes **19-21** on your answer sheet.

List of statements

- A Wrote criticisms of children's literature
- B Used animals to demonstrate the absurdity of fairy tales
- C Was not a writer originally
- D Translated a book into English
- E Didn't write in the English language

- 19 Thomas Boreham
- 20 Mrs. Sarah trimmer
- 21 Grimm Brothers

Questions 22-26

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

In boxes **22-26** 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 Children didn't start to read books until 1700.
- 23 Sarah Trimmer believed that children's books should set good examples.
- 24 Parents were concerned about the violence in children's books.
- 25 An interest in the folklore changed the direction of the development of children's books.
- 26 Today children's book writers believe their works should appeal to both children and adults.

READING PASSAGE 3

You should spend about 20 minutes on **Questions 27-40**, which are based on Reading Passage 3 below.

Talc Powder

Peter Rrigg discovers how talc from Luzenac's Trimouns in France find its way into food and agricultural products—from chewing gum to olive oil.

High in the French Pyrenees, some 1,700m above sea level, lies Trimouns, a huge deposit of hydrated magnesium silicate talc to you and me. Talc from Trimouns, and from ten other Luzenac mines across the globe, is used in the manufacture of a vast array of everyday products extending from paper, paint and plaster to cosmetics, plastics and car tyres. And of course there is always talc's best known end use: talcum powder for babies' bottoms. But the true versatility of this remarkable mineral is nowhere better displayed than in its sometimes surprising use in certain niche markets in the food and agriculture industries.

Take, for example, the chewing gum business. Every year, Talc de Luzenac France which owns and operates the Trimouns mine and is a member of the international Luzenac Group (part of Rio Tinto minerals)—supplies about 6,000 tonnes of talc to chewing gum manufacturers in Europe. "We've been selling to this sector of the market since the 1960s," says Laurent Fournier, sales manager in Luzenac's Specialties business unit in Toulouse. "Admittedly, in terms of our total annual sales of talc, the amount we supply to chewing gum manufacturers is relatively small, but we see it as a valuable niche market: one where customers place a premium on securing supplies from a reliable, high quality source. Because of this, long term allegiance to a proven supplier is very much a feature of this sector of the talc market." "Switching sources in the way that you might choose to buy, say, paperclips from Supplier A rather than from Supplier B is not a easy option for chewing gum manufacturers," Fournier says. "The cost of reformulating is high, so when customers are using a talc grade that works, even if it's expensive, they are understandably reluctant to switch."

But how is talc actually used in the manufacture of chewing gum? Patrick Delord, an engineer with a degree in agronomics, who has been with Luzenac for 22 years and is now senior market development manager, Agriculture and Food, in Europe, explains that chewing gums has four main components. "The most important of them is the gum base," he says. "It's the gum base that puts the chew into chewing gum. It binds all the ingredients together, creating a soft, smooth texture. To this the manufacturer then adds sweeteners, softeners and flavourings. Our talc is used as a filler in the gum base. The amount varies between, say, ten and 35 per cent, depending on the type of gum. Fruit flavoured chewing gum, for example, is slightly acidic and would react with the calcium carbonate that the manufacturer might otherwise use as a filler. Talc, on the other hand, makes an ideal filler because it's non reactive chemically. In the factory, talc is also used to dust the gum base pellets and to stop the chewing gum sticking during the lamination and packing process," Delord adds.

The chewing gum business is, however, just one example of talc's use in the food sector. For the past 20 years or so, olive oil processors in Spain have been taking advantage of talc's unique characteristics to help them boost the amount of oil they extract from crushed olives. According to Patrick Delord, talc is especially useful for treating what he calls "difficult" olives. After the olives are harvested preferably early in the morning because their taste is better if they are gathered in the cool of the day they are taken to the processing plant. There they are crushed and then stirred for 30-45 minutes. In the old

days, the resulting paste was passed through an olive press but nowadays it's more common to add water and centrifuge the mixture to separate the water and oil from the solid matter. The oil and water are then allowed to settle so that the olive oil layer can be decanted off and bottled. "Difficult" olives are those that are more reluctant than the norm to yield up their full oil content. This may be attributable to the particular species of olive, or to its water content and the time of year the olives are collected at the beginning and the end of the season their water content is often either too high or too low. These olives are easy to recognize because they produce a lot of extra foam during the stirring process, a consequence of an excess of a fine solid that acts as a natural emulsifier. The oil in this emulsion is lost when the water is disposed of. Not only that, if the waste water is disposed of directly into local fields often the case in many smaller processing operations the emulsified oil may take some time to biodegrade and so be harmful to the environment.

"If you add between a half and two percent of talc by weight during the stirring process, it absorbs the natural emulsifier in the olives and so boosts the amount of oil you can extract," says Delord. "In addition, talc's flat, 'platy' structure helps increase the size of the oil droplets liberated during stirring, which again improves the yield. However, because talc is chemically inert, it doesn't affect the colour, taste, appearance or composition of the resulting olive oil."

If the use of talc in olive oil processing and in chewing gum is long established, new applications in the food and agriculture industries are also constantly being sought by Luzenac. One such promising new market is fruit crop protection, being pioneered in the US. Just like people, fruit can get sunburned. In fact, in very sunny regions up to 45 percent of atypical crop can be affected by heat stress and sunburn. However, in the case of fruit, it's not so much the ultra violet rays which harm the crop as the high surface temperature that the sun's rays create.

To combat this, farmers normally use either chemicals or spray a continuous fine canopy of mist above the fruit trees or bushes. The trouble is, this uses a lot of water normally a precious commodity in hot, sunny areas and it is therefore expensive. What's more, the ground can quickly become waterlogged." So our idea was to coat the fruit with talc to protect it from the sun," says Greg Hunter, a marketing specialist who has been with Luzenac for ten years. "But to do this, several technical challenges had first to be overcome. Talc is very hydrophobic: it doesn't like water. So in order to have a viable product we needed a wettable powder something that would go readily into suspension so that it could be sprayed onto the fruit. It also had to break the surface tension of the cutin (the natural waxy, waterproof layer on the fruit) and of course it had to wash off easily when the fruit was harvested. No one's going to want an apple that's covered in talc."

Initial trials in the state of Washington in 2003 showed that when the product was sprayed onto Granny Smith apples, it reduced their surface temperature and lowered the incidence of sunburn by up to 60 per cent. Today the new product, known as Invelop Maximum SPF, is in its second commercial year on the US market. Apple growers are the primary target although Hunter believes grape growers represent another sector with long term potential. He is also hopeful of extending sales to overseas markets such as Australia, South America and southern Europe.

Questions 27-32

Use the information in the passage to match each use of talc power with correct application from **A**, **B** or **C**.

Write the appropriate letters **A-C** in boxes **27-32** on your answer sheet.

NB you may use any letter **more than once**

A Chewing gum manufacture

B Olive oil extraction

C Fruit crop protection

- 27 Talc is used to prevent foaming.
- 28 Talc is used to prevent stickiness.
- 29 Talc is used to boost production.
- 30 Talc is used as a filler to provide a base.
- 31 Talc is used to prevent sunburn.
- 32 Talc is used to help increase the size of the product.

Questions 33-38

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

Write your answers in boxes **33-38** on your answer sheet.

The use of talc powder in the olive oil industry in Spain has been around for 33 years. It is extremely useful in dealing with “difficult” olives which often produce a lot of 34 due to the high content of solid matter. The traditional method of oil extraction used in some smaller plants often produces 35 , which contains emulsified oil, and if it is directly disposed of, it may be 36 to the environment, because it can not 37 But adding talc powder can absorb the emulsifier and increase the production, because the size of oil 38 grows.

Questions 39-40

Answer the questions below using **NO MORE THAN THREE WORDS** from the passage for each answer.

Write your answers in boxes **39-40** on your answer sheet.

What are the last two stages of chewing gum manufacturing process?

39

Which group of farmers does Invelop intend to target next?

40