READING PASSAGE 1

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

The development of Plastic

A. During the nineteenth century, Europe became the birthplace of industrial rubber products, and the material quickly rose to prominence thanks to its many practical applications. Natural rubber was once widely used, but over the twentieth century a variety of new synthetic materials called plastics replaced it. As a chemical consisting of giant molecules bonded together from many smaller, simpler components, rubber is a polymer. The chemical industry produces a wide variety of plastics using the same bonding principle—polymerization.

B. In the USA, a competition spurred the creation of the first plastic. In the 1860s, a reward of $10,000 was offered to anyone who could come up with a suitable substitute for ivory in billiard ball production. Ivory supplies were dwindling at the time. John Wesley Hyatt's celluloid substance was the winning entry. Celluloid was created by dissolving cellulose, a plant-based carbohydrate, in a camphor-and-ethanol solution. Knife grips, snap-off cuffs, eyeglasses, and even photographic film were some of the first goods to use this novel material. No motion picture company would have been able to launch towards the tail end of the 19th century if not for celluloid.

C. Celluloid is a thermoplastic because it can be repeatedly warmed to soften it and change its form. Leo Baekeland, a Belgian chemist working in the United States, created a new type of plastic in 1907 by triggering a reaction between phenol and formaldehyde. Bakelite was the first of the thermosets' plastics, which can be cast and molded while hot but cannot be softened by heat and molded once they have set; Baekeland gave the material this name. Bakelite was impervious to water, acids, and moderate heat, and it also served as a good insulator. Due to its useful features, it was quickly used in the production of electrical components for automobiles, as well as switches and other domestic things like knife handles.

D. The search for more tiny molecules that could be linked together to form polymers was soon undertaken by chemists. Thermoplastic polyethylene was first created in the 1930s by British chemists by polymerizing ethylene gas in a high-temperature, high-pressure environment. By the 1950s,

polypropylene had emerged as a viable alternative. Bottles, pipelines, and plastic bags were all manufactured using both. PVC (polyvinyl chloride) is a strong, flame-retardant plastic that was created by substituting a hydrogen atom in ethylene with a chlorine atom, making it ideal for use in pipe and gutter systems. In addition, PVC may be made soft by including different chemicals, making it an acceptable rubber replacement for applications such as watertight apparel. PTFE, or Teflon, was a material that was very similar (polytetrafluoroethylene). As a result of its low coefficient of friction, it was found to be useful in applications such as bearings, rollers, and non-stick cookware. Created in Germany in the 1930s, polystyrene was a transparent plastic widely used in the packaging of food, household goods, and toys. The white, stiff foam known as expanded polystyrene was commonly used for both packing and insulation. Germany is also responsible for the development of polyurethanes, which have since found widespread usage as adhesives, coatings, and, in the form of rigid foams, insulation. All of these items are made from chemicals extracted from crude oil, and as such, share the same chemical components (carbon and hydrogen) as many polymers.

E. Also in the 1930s, the first synthetic fiber, nylon, was developed. Wallace Carothers, an American scientist who later worked for the Du Pont Company, came up with the idea. He discovered that two chemicals, hexamethylenediamine, and adipic acid, could combine under certain conditions to make a polymer that could be pushed out of holes, stretched, and weaved like silk. Parachutes for the United States military during World War II were its first application. In the years following World War II, nylon gradually supplanted silk in the production of stockings. Other synthetic fibers followed suit, with Orion, Acrilan, and Terylene joining the nylon family. Most clothing today is constructed from a combination of natural fibers like cotton and wool and man-made fibers that are more durable and require less maintenance.

F. Plastic's invincibility is its greatest strength. This feature has many drawbacks, though, as evidenced by the fact that even the most distant islands have beaches filled with plastic bottles that cannot be recycled or broken down. Not only are there many distinct kinds of plastic, but they're typically all used in the same products, making recycling a complex process. To make plastics biodegradable, they can be reinforced with a substance like starch, which is then broken down by microbes. Bottles built from these materials must be kept in the dark so that they don't decompose before they're used, but they can be made to contain other materials that slowly decompose in sunlight.

Questions 1–7

Complete the table below.

*Choose **NO MORE THAN THREE WORDS** from the passages for each answer.*
*Write your answers in boxes **1-7** on your answer sheet*

N6me of pl6stic	D6te of invention	Original region	Property	Common
Celluloid	1860s	US		Clothing and l. _____
2. _____	1907	US	This material can be molded and cast, but it cannot be melted.	3. _____ household items and car part
Polythene	1930	4. _____		Bottles
Rigid PVC			5. _____	Drains and Gutters

Polystyrene	l930s	Germany	6. Transparent and resembling _____	Food Containers domestic
Polyurethanes		Germany	7. Formation like _	Adhesives, coatings, and insulation

Questions 8–11

*Do the following statements agree with the information in Reading Passage? In boxes **8-11** on your answer sheet write*

TRUE if the statement agrees with the information
FALSE if the statement contradicts the information
NOT GIVEN if there is no information about the statement

8. Both celluloidd and Bakelite are equally affected by heat.

9. When multiple types of plastic are combined, recycling can become more of a challenge.

10. Plastic and rubber have vastly dissimilar chemical structures.

11. The renowned chemist John Wesley.

Questions 12−13

Choose the correct letter, ***a, b, c, or d.***

Write your answers in boxes ***12-13*** *on your answer sheet.*

12. Which substance can be added to plastic to make it biodegradable?

a. Formaldehyde
b. Bakelite
c. Starch
d. Teflon

13. In the 1930s, British chemists polymerized which gas to develop the first thermoplastic polyethylene?

a. Methane
b. Ethylene
c. Carbon
d. Hydrogen

READING PASSAGE 2

*You should spend about 20 minutes on **Questions 14-26**, which are based on Reading Passage 1*

INVASIVE SPECIES

A Invasive species often triumph as a result of good intentions gone wrong. Take Japanese knotweed (Fallopia japonica), introduced to Britain by enthusiastic Victorian gardeners who thought it an ornamental delight that doubled as cattle feed. But from just a scrap of root no bigger than a pea it could grow through tarmac, pavements, and brick walls. A century later, its spread is considered such a threat that planting or dumping knotweed is a crime, knotweed is so hated because it suffocates other plants, replacing them with an unproductive, leafy monotony. Then there is the Nile perch (Lates niloticus), branded one of the world's worst invaders by conservationists. It is a freshwater fish that can grow to huge proportions. Again, with good intentions, it was introduced in 1954 to Lake Victoria, straddling Tanzania. Kenya, and Uganda. Since then, it has helped push over 200 well-established local fish species to extinction. Like the Nile perch, the cane toad (Bufo marinus) eats almost anything it gets its mouth around. Introduced for pest control, it turned out to be noisy, fast spreading, and a greater pest itself.

B As it is in nature, so it is in the economy. Big superstores and chain retailers were allowed to spread by planners, town councils, and governments in awe of big business. But then it started to go wrong. The chains became the economic equivalent of invasive species: hungry, indiscriminate, often antisocial and destructive. When no one was paying much attention, the superstores and cloned shops grew to dominate and suffocate the economic ecosystem.

They passed through planning regulations as easily as knotweed pushes through tarmac, devoured smaller and independent retailers with as much reflection as the Nile perch cleansing Lake Victoria of competition. They were often introduced to provide a specific service but outgrew their habitats until their cash till song could be heard on every street corner, forecourt, round about, and out of town shopping centre. Neither in balance, nor even a boom bust cycle with other similar, local species of shop; they began permanently to displace them.

C Natural scientists use a whole new term to describe the current epoch of comprehensive global human interference in ecosystems. Our time, they say, should be called the "Homogocene" to describe the way that distinctiveness and difference are being eroded. A combination of the creep of invasive species and habitats destroyed by development is driving a mass extinction. The World Conservation Union warns that such invasions are leading to the irretrievable loss of native biodiversity. Typical characteristics of an invasive species include the absence of predators, hardiness, and a generalist diet. Whatever the reason for their arrival and proliferation, invasive species tend to cause a disruption of the ecosystem that is catastrophic for native species.

D The big, centralised logistical operations of the supermarkets are likewise driving the homogenisation of business, shopping, eating, farming, food, the landscape, the environment, and our daily lives. In the process, Britain is being sucked into a vortex of US-style, chain-store-led. clone retailing, both in towns and in soulless "big box" out-of-town shopping parks — what they call in the US, with its associated suburban sprawl, the "dead zone".
They are spreading in the way "invasive species" spread in nature, lacking checks and balances, killing off diversity and "native" (in other words, local) species. Tesco is not the only guilty party (think of McDonald's. Starbucks, and Gap), but it is possibly the largest driving force. With around 2.000 stores in Britain, almost one third of the grocery market, and rapid international growth, city analysts believe the brand has the land and resources in place already to double its UK floor space. Can anything stop it?

E Bear in mind those characteristics of an invasive species: the absence of predators (real commercial competition or effective regulators to hold them back); hardiness (the legions of corporate lawyers, financial leverage, and endless commercial cost cutting); and a generalist diet (supermarkets will sell virtually anything, and chain stores operate according to a low common denominator). If you want diversity in your world rather than one kind of plant in your garden, one kind of fish in your lake and only one type of venomous, croaking toad under your shed, then you have to manage for that outcome. When we garden, we hold back aggressive, opportunistic plants in order to keep space open for a celebration of variety and colour.

F Like it or not (and it is something about which most policy makers and economists are in deep denial), weakly regulated markets give free rein to economic invasive species and hence tend towards monopoly. This is the great modern economic irony. Advocates of free markets argue against checks and balances to counter the power of big business, but in doing so ultimately destroy the possibility of markets that could meaningfully be called free, or, rather, "open".

They resist anti-monopoly regulation in the name of providing consumer choice, and in the process they ultimately destroy it. In some important ways, we are returning to an earlier phase of corporatism. Henry Ford told customers they could have any colour of car, as long as it was black. The scale and seriousness of Tesco's ambition mean that, before long, unless we recognise what is happening and have regulators up to the job, one day we will be able to shop anywhere we like, as long as it is Tesco.

QUESTIONS 14-17

Find out which paragraph contains each of the following pieces of information ***(A-F).***

14 The suggestion that the government should legislate to control invasive species of a corporate nature

15 Examples of the problems with the spread of specific invasive species in nature

16 A description of how invasive species in nature are different from other ones

17 Examples of companies that can be considered invasive species

Questions 18-21

Complete the following sentences using the text for each gap

NO MORE THAN THREE WORDS

Japanese knotweed was used for decoration and as **18**…… "Homogocene" is the word used by natural scientists to describe the **19**……. we are living in. **20**..... , plenty of money, and cost-cutting increase the strength of big supermarkets. The article suggests that **21**…… allow economically invasive species to do what they want and eventually lead to monopolies.

Questions 22-26

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

22 The Nile perch was introduced to Lake Victoria as a source of food for local people.
23 Planning regulations have been ineffective against big supermarkets.
24 Supermarkets in Britain sell a limited range of products.
25 Chain stores only sell low-quality goods.
26 The writer is against the domination of big supermarkets.

READING PASSAGE 3

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

Communicating Styles and Conflict

A Since the time of Hippocrates (460-370 B.C.), people have tried to comprehend others by categorising them based on personality type or temperament. According to Hippocrates, there are four separate bodily fluids that affect four different temperamental subtypes. 500 years later, Galen expanded on his ideas. Although we no longer think the source is the kinds of body fluid that predominate in our systems, there are many self-assessment techniques available today that connect to the fundamental descriptions given by Galen.

B Self-evaluation is the criteria which is used to determine one's own values. The style that people use to learn, communicate, handle conflict or other characteristics of an individual will help to depersonalise conflict affiliation between two or more people. Loss of self occurs when you realise that others are not trying to be difficult but instead, they require different or more information than you do. They don't mean to be rude, they are so attentive to the task they overlook welcoming others. They would like to work smart and fast but they don't want to jeopardise the working relationship. They were aware of their work but it would be done correctly when required information is collected, which takes time to gather.

C Hippocrates and later Galen have been determined to summarise personality with four basic temperaments Sanguine(is capable of talking to new friends like they are known for a long time), Melancholic (almost always deep in thought).
Choleric(they are ambitious, brave and proud, but they can also be violent) Phlegmatic(slow to warm up to others but will make friends fairly easily). These temperaments were developed centuries ago and they were still somewhat adapted, you could update the wording. Nowadays, they translate into the four fairly common communication styles described below.

The sanguine person would have the capability to talk with an unknown person like they were already close friends. They also have a spirited style of communication. These people speak with expression. They often speak very fast and also invest their time, emotion and energy in their communication. They can easily give an example story to their talk. It may or may not explain the point which they are trying to make. Because of their enthusiasm, they're great team motivators. They are always concerned about the people and their relationship. They usually focus on the bigger picture and their high level of energy comes at a strong time, which means sometimes they miss details or the correct order of things. These people find lots of conflict and differences of opinion and love to engage in spirited discussion. They love change, they are constantly looking for something more exciting and adventurous.

E Tile phlegmatic person and preserving- translates into the technical or systematic communication style. This style of communication mainly focused on reality and technical details. These types of people are very much focused on their task, they have an orderly methodical way of approaching, and they do not focus on people, emotions or concerns. They also focus on the required details to accomplish a task. Sometimes the details flood out the big picture and focus needs to be brought back to the context of the task. These sorts of people always treat facts as a front end to make decisions and they are uncomfortable with the conflict. They need time to adapt to the change and need to understand both the logic of it and the steps involved.

F Tile melancholic persons who are soft-hearted and oriented toward doing things for others translate into considerate or sympathetic communication style. This style of people is focused on people and relationships. They seem to be good listeners and do things for other people, even sometimes they do to the people who did harm to themselves. They want to put in for others ' opinions and make sure everyone is comfortable with whatever is required to get the job done. Sometimes this focus on others can distract from the task at hand, because they are so focused on others' needs and smoothing over issues, they do not like conflict. People believe that change menaces the level quo and tends to make people feel tense, because of this people with the same communication style, like

phlegmatic people, would take some time to accept the situation and change themself to adapt to it.

G The choleric temperament people have a bold and direct style of communication. These people are brief in their communication - the fewer words the better. People with this style are overactive and they love to be involved in many activities at one time. They are focused on tasks and outcomes and often forget that the people involved in carrying out the task have needs. They don't do detailed studies on the work they are doing so they underestimate the time which could take for that. They are so direct, they often look forceful and can be very intimidating to others. They always welcome someone to challenge them. But people with other styles are scared to do so. They can also handle the changes better.

H A well-functioning team should have all these types of communicating styles for true effectiveness. All teams should focus on the task as well as on the relationship to achieve those tasks. They need a big-picture perspective of the context of their work, and they need the details to be identified and taken care of for success. We all also have aspects of each style within us. Some of us can easily move from one style to another and we can easily adapt our style to that situation, with focus on tasks or relationships. For others it is difficult, their dominant style is very evident, and they feel it is more challenging to tackle the situation from the perspective of another style. The work environment can influence communication styles either by the type of work that is required or by the predominance of one style reflected in that environment. Some people use one style at work and another style at home.

The above information about communication style is that we have the ability to develop flexibility in our styles. The greater the flexibility we have the more skilled we usually are at handling possible and actual conflicts. Usually, it is relevant to us to do so. We feel shy, either because it is important or because there are incentives in our surroundings to encourage it. The key is we should be flexible with our communication style." Whether you think you can or you can't, you're right!" by Henry Ford.

Questions 27–34

Read the passage given with 8 sections, A-H.

Choose the correct heading for each section given below.

List of Headings

- i Summarising personality types
- ii Combined styles for workplace
- iii Physical explanation
- iv A lively person who encourages
- v Demanding and unsympathetic personality
- vi Lazy and careless personality
- vi The benefits of understanding communication styles
- viii Cautious and caring
- ix Factual and analytical personality
- x Self-assessment determines one's temperament

27 Section A

28 Section B

28 Section C

29 Section D

30 Section E

31 Section F

33 Section G

34 Section H

Questions 35–38

*Do the following statements agree with the information in Reading Passage? In boxes **34-38** on your answer sheet write*

TRUE	if the statement agrees with the information
FALSE	if the statement contradicts the information
NOT GIVEN	if there is no information about the statement

34 It is believed that sanguine people dislike variety

35 Melancholic and phlegmatic people have similar characteristics.

36 Managers often select their best employees according to personality types.

37 It is possible to change one's personality type.

38 Workplace environments can affect which communication style is most effective.

Question 40

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

Write an appropriate answer on your answer sheet.

40 The writer believes using self-assessment tools can …

A help to develop one's personality.

B help to understand colleagues' behaviour.

C improves one's relationship with the employer.

D directly resolve conflicts

1. Photographic film	2. Bakelite	3. Switches	4. Britain/UK
5. Fireproof	6. Clear and glass-like	7. Rigid	8. False
9. Not given	10. False	11. True	12. C
13. B	14. F	15. A	16. C
17. D	18. Cattle feed	19. Epoch	20. Corporate lawyers
21.	22. True	23. True	24. False
25. Not Given	26. True	27. iii	28. vii
29. I	30.iv	31. ix	32. viii
33. v	34. ii	35. False	36. True
37. Not Given	38. True	39. True	40. B

READING PASSAGE 2

You should spend about 20 minutes on **Questions 1-13**, which are based on Reading Passage 2 on pages 2 and 3.

Sleepy Students Perform Worse

A. Staying up an hour or two past bedtime makes it far harder for kids to learn, say scientists who deprived youngsters of sleep and tested whether their teachers could tell the difference. They could. If parents want their children to thrive academically, “Getting them to sleep on time is as important as getting them to school on time," said psychologist Gahan Fallone, who conducted the research at Brown Medical School.

B. The study, unveiled Thursday at an American Medical Association (AMA) science writers meeting, was conducted on healthy children who had no evidence of sleep- or learning-related disorders. Difficulty paying attention was among the problems the sleepy youngsters faced - raising the question of whether sleep deprivation could prove even worse for people with attention deficit hyperactivity disorder, or ADHD. Fallone now is studying that question, and suspects that sleep problems “could hit children with ADHD as a double whammy”.

C. Sleep experts have long warned that Americans of all ages do not get enough shuteye. Sleep is important for health, bringing a range of benefits that, as Shakespeare put it, “knits up the ravelled sleave of care”. Not getting enough is linked to a host of problems, from car crashes as drivers doze off to crippled memory and inhibited creativity. Exactly how much sleep correlates with school performance is hard to prove. So, Brown researchers set out to test whether teachers could detect problems with attention and learning when children stayed up late - even if the teachers had no idea how much sleep their students actually got.

D. They recruited seventy-four 6- to 12-year-olds from Rhode Island and southern Massachusetts for the three-week study. For one week, the youngsters went to bed and woke up at their usual times. They already were fairly good sleepers, getting nine to 9.5 hours of sleep a night. Another week, they were assigned to spend no fewer than ten hours in bed a night. The other week, they were kept up later than usual: First -and second-graders were in bed no more than eight hours and the older children no more than 6.5 hours. In addition to parents’ reports, the youngsters wore motion detecting wrist monitors to ensure compliance.

E. Teachers were not told how much the children slept or which week they stayed up late, but rated the students on a variety of performance measures each week. The teachers reported significantly more academic problems during the week of sleep deprivation, the study, which will be published in the journal Sleep in December, concluded. Students who got eight hours of sleep or less a night were more forgetful, had the most trouble learning new lessons, and had the most problems paying attention, reported Fallone, now at the Forest Institute of Professional Psychology

F. Sleep has long been a concern of educators. Potter-Burns Elementary School Sends notes to parents reminding them to make sure students get enough sleep prior to the
school’s yearly achievement testing. Another school considers it important enough to include in the school’s monthly newsletters. Definitely, there is an impact on students’ performance if they come to school tired. However, the findings may change physician practice, said Dr. Regina Benjamin, a family physician in Bayou La Batre, who reviewed the data at the Thursday’s AMA meeting.“I don't ask about sleep” when evaluating academically struggling students, shenoted. “I’m going to start.”

G. So how much sleep do kids need? Recommended amounts range from about tento eleven hours a night for young elementary students to 8.5 hours for teens. Falloneinsists that his own second-grader get ten hours a night, even when it meant dropping soccer - season that practice did not start until 7:30 — too late for her to fit in dinner and time to wind down before she needed to be snoozing. “It’s tough,” he acknowledged, but “parents must believe in the importance of sleep."

Questions 1-4

The text has 7 paragraphs (**A** - **G**).

Which paragraph contains each of the following pieces of information?

1. Traffic accidents are sometimes caused by lack of sleep.
2. The number of children included in the study
3. How two schools are trying to deal with the problem
4. How the effect of having less sleep was measured

Questions 5-8

Complete the following sentences using **NO MORE THAN TWO WORDS** from the text for each gap.

Fallone is now studying the sleep patterns of children with **5**_____.

The researchers used **6**_____that show movement to check that children went to bed at the right time.

Students with less sleep had problems with memory, remembering new material, and **7**_____.

Fallone admitted that it was **8**_____for children to get enough sleep.

Questions 9-13

In boxes 9-13 on your answer sheet, write

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

9. The results of the study were first distributed to principals ofAmerican schools

10. Some of the children in the study had previously shown signs of sleeping problems.

11. The study could influence how doctors deal with children’s health problems.

12. Fallone does not let his daughter play soccer.

13. Staying up later is acceptable if the child is doing homework

1C

2D

3F

4E

5ADHD

6wrist monitors

7paying attention

8tough

9FALSE

10FALSE

11TRUE

12NOT GIVEN

13NOT GIVEN

READING PASSAGE 1

Nanotechnology: its development and uses

A. Nanotechnology has been hailed by many as being a twentieth-century miracle of science. Essentially, nanotechnology, a term derived from Greek, translating literally as 'dwarf technology' is, as the origin of its name suggests, engineering at the atomic level. Scientists work with particles of substances known as 'nanoparticles' which may measure no more than 1 nanometre or a billionth of a metre. That's around 40,000 times smaller than the width of the average human hair. Whilst some of these substances derived from carbon compounds are manufactured, others, such as metals, are naturally-occurring or arise as a by-product of another process e.g. volcanic ash or smoke from wood burning. What makes these substances of such scientific interest is that their minute size facilitates medical and technological processes that would otherwise be impossible.

B. It may be something of a revelation for many of us to learn that nanotechnology - or its concept - is far from cutting-edge science. In fact, nanotechnology as an idea was first referred to in an influential lecture by American physicist, Richard Feynman, as far back as 1959. During the lecture, entitled 'There's Plenty of Room at the Bottom', Feynman outlined the basic concept of nanotechnology. Individual atoms and molecules, he claimed, could in the future be created by a physical process. Such a process, he envisaged, would involve the building of a set of precise tools to build and operate another proportionally smaller set. The building of increasingly minute tools at the microscopic level would in turn produce ultra-microscopic materials, later to become known as 'nanoparticles'.

C. Strangely, what should have sparked a scientific revolution was then virtually forgotten about for the next 15 years. In 1974, a Japanese scientist, Norio Taniguchi, of the Tokyo University of Science reintroduced Feynman's theory and put a new name to an old concept, referring to the science as 'nanotechnology'. However, it wasn't until nearly a decade later, in the 1980s, that the way was paved for nanotechnology to leave the realm of theoretical science and become reality. Two major scientific developments within a relatively short period were to enable practical application of nanotechnology. The invention of the Scanning Tunnelling Microscope (STM), combined with the discovery of nano-sized particles termed 'fullerenes', were to prove a turning point in nanotechnology.

D. Fullerenes are derived from carbon molecules and, in common with other nanoparticles, possess chemical and physical properties that are of huge scientific interest. The potential value of fullerenes for medical science was first raised in 2003 and in 2005 when the scientific magazine 'Chemistry and Biology' ran an article describing the use of fullerenes as light-activated antimicrobial agents. Since then, fullerenes have been used for several biomedical applications ranging from X-ray imaging to treating cancer by targeting cancer cells. In addition, these nanoparticles have been used in the manufacture of commercial products, from sunscreen to cosmetics and some food products. Furthermore, nanoparticles of metals, like gold and silver, have been used in environmental clean-ups of oil slicks and other forms of pollution. The remarkable properties of nanoparticles are down to two main factors: their greater surface-to-weight ratio, compared to larger particles which promotes the attachment of substances to their surface, and their minute size which allows them to penetrate cell membranes. These properties are of great benefit, for example in medicine, as drugs to fight cancer or AIDS can be attached to nanoparticles to reach their target cell in the human body.

E. However, despite the amazing properties attributed to nanoparticles such as fullerenes, nanotechnology has yet to win wider universal acceptance in scientific circles. For the very properties that make nanoparticles so valuable to technology and medical science are also the ones that make them potentially so toxic. Such properties are potentially lethal if toxic substances attach themselves to the same nanoparticles, thereby delivering a fatal toxin through the cell membranes into the cells themselves. The toxic effect of these compounds is further increased, since their size permits them to enter the bloodstream and hence the body's major organs. Furthermore, the nanoparticles in themselves are essentially a foreign element being introduced to the body. Unlike foreign elements, such as bacteria, the body has no natural immune system to deaI with these ultramicroscopic particles. Scientists have yet to convince the nanotechnology sceptics that the potential side effects of nanoparticles are more than compensated for by the advantages that they confer. It may be, however, that opposition to this technology is no more than a general distrust of scientific innovation. In fact, Urban Wiesing from the University of Tubingen has been quoted as saying 'Many of the risks associated with nanotechnology have at least been encountered in part in other technologies as well.' He also believes that regulations can be put in place to minimise such risks. This is a view echoed by the Fed eral Environment Agency that proposes that such risks are vastly outweighed by the potential benefits of nanotechnology, in particular for the environment.

Questions 1-5

The text has five paragraphs, **A-E**.Which paragraph contains the following information? Write the correct letter,

A-E, next to questions 1-5.

1. Promising beginnings

2. Definition of a revolutionary technology

3. Repackaging an old idea

4. Dubious attributes

5. The foundation of a new technology

Questions 6-10

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

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

6. Nanotechnology

A. has limited value.

B. is not related to science.

C. incites controversy.

D. poses insurmountable safety issues.

7. In the beginning, nanotechnology was

A. overlooked as a science.

B. considered to be irrelevant.

C. highly unpopular.

D. regarded as being revolutionary.

8. Nanoparticles are a product of

A. manufacturing processes alone.

B. natural and manufactured processes.

C. purely biological processes.

D. environmental factors alone.

9. Nanotechnology remained a purely theoretical science until

A. other technologies caught up with it.

B. scientists were better able to understand its practical applications.

C. Taniguchi convinced other scientists of its practical value.

D. a scientist invented a new technology.

10. Safety concerns about nanotechnology are

A. completely unfounded.

B. exaggerated by its detractors.

C. real but manageable.

D. misunderstood.

Questions 11-13

Complete the sentences.

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

A major **11.**_____ in the field of nanotechnology came with the discovery of fullerenes and the invention of the Scanning Tunnelling Microscope.

Amongst scientists, nanotechnology has not met with **12.** _____.

The ability of nanoparticles to penetrate **13.** _____is somewhat of a mixed blessing

1. D
2. A
3. C
4. E
5. B
6. C
7. A
8. B
9. A
10. C
11. TURNING POINT
12. UNIVERSAL ACCEPTANCE
13. CELL MEMBRANES

READING PASSAGE 1

A gem from the sea

A Throughout history, pearls have held a unique presence within the wealthy and powerful. For instance, the pearl was the favored gem of the wealthy during the Roman Empire. This gift from the sea had been brought back from the orient by the Roman conquests. Roman women wore pearls to bed so they could be reminded of their wealth immediately upon waking up. Before jewelers learned to cut gems, the pearl was of greater value than the diamond. In the Orient and Persia Empire, pearls were ground into powders to cure anything from heart disease to epilepsy, with possible aphrodisiac uses as well. Pearls were once considered an exclusive privilege for royalty. A law in 1612 drawn up by the Duke of Saxony prohibited the wearing of pearls by nobility, professors, doctors or their wives in an effort to further distinguish royal appearance. American Indians also used freshwater pearls from the Mississippi River as decorations and jewelry.

B There are essentially three types of pearls: natural, cultured and imitation. A natural pearl (often called an Oriental pearl) forms when an irritant, such as a piece of sand, works its way into a particular species of oyster, mussel, or clam. As a defense mechanism, the mollusk secretes a fluid to coat the irritant. Layer upon layer of this coating is deposited on the irritant until a lustrous pearl is formed.

C The only difference natural pearls and cultured pearls is that the irritant is a surgically implanted bead or piece of shell called Mother of Pearl. Often, these shells are ground oyster shells that arc worth significant amounts of money in their own rights as irritant-catalysts for quality pearls. The resulting core is, therefore, much larger than in a natural pearl. Yet, as long as there are enough layers of nacre (the secreted fluid covering the irritant) to result in a beautiful, gem-quality pearl, the size of the nucleus is of no consequence to beauty or durability.

D Pearls can come from cither salt or freshwater sources. Typically, saltwater pearls tend to be higher quality, although there are several types of freshwater pearls that are considered high in quality as well. Freshwater pearls tend to be very irregular in shape, with a puffed rice appearance the most prevalent. Nevertheless, it is each individual pearls merits that determines value more than the source of the pearl. Saltwater pearl oysters are usually cultivated in protected lagoons or volcanic atolls. However, most freshwater cultured pearls sold today come from China. Cultured pearls are the response of the shell to a tissue implant. A tiny piece of mantle tissue from a donor shell is transplanted into a recipient shell. This graft will form a pearl sac and the tissue will precipitate calcium carbonate into this pocket. There are a number of options for producing cultured pearls: use freshwater or seawater shells, transplant the graft into the mantle or into the gonad, add a spherical bead or do it non-bcadcd. The majority of saltwater cultured pearls arc grown with beads. surface, orient and luster. In general, cultured pearls are less valuable than natural pearls, whereas imitation pearls almost have no value. One way that jewelers can determine whether a pearl is cultured or natural is to have a gem lab perform an x-ray of the pearl. If the x-ray reveals a nucleus, the pearl is likely a bead-nucleated saltwater pearl. If no nucleus is present, but irregular and small dark inner spots indicating a cavity are visible, combined with concentric rings of organic substance, the pearl is likely a cultured freshwater. Cultured freshwater pearls can often be confused for natural pearls which present as homogeneous pictures which continuously darken toward the surface of the pearl. Natural pearls will often show larger cavities where organic matter has dried out and decomposed. Although imitation pearls look the part, they do not have the same weight or smoothness as real pearls, and their luster will also dim greatly. Among cultured pearls, Akoya pearls from Japan arc some of the most lustrous. A good quality necklace of 40 Akoya pearls measuring 7mm in diameter sells for about $1,500, while a super- high quality strand sells for about $4,500. Size on the other hand, has to do with the age of the oyster that created the pearl (the more mature oysters produce larger pearls) and the location in which the pearl was cultured. The South Sea waters of Australia tend to produce the larger pearls; probably because the water along the coast line is supplied with rich nutrients from the ocean floor. Also, the type of mussel common to the area seems to possess a predilection for producing comparatively large pearls.

E. Regardless of the method used to acquire a pearl, the process usually takes several years. Mussels must reach a mature age, which can take up to 3 years, and then be implanted or naturally receive an irritant. Once the irritant is in place, it can take up to another 3 years for the pearl to reach its full size. Often, the irritant may be rejected, the pearl will be terrifically misshapen, or the oyster may simply die from disease or countless other complications. By the end of a 5 to 11) year cycle, only 50% of the oysters will have survived. And of the pearls produced, only approximately 5% arc of substantial quality for top jewelry makers. From the outset, a pearl farmer can figure on spending over $100 for every oyster that is fanned, of which many will produce nothing or die.

F. Imitation pearls arc a different story altogether. In most cases, a glass bead is dipped into a solution made from fish scales This coating is thin and may eventually wear off. One can usually tell an imitation by biting on it. Fake pearls glide across your teeth, while the layers of nacre on real pearls feel gritty. The Island of Mallorca (in Spain) is known for its imitation pearl industry. Quality natural pearls are very rare jewels. The actual value of a natural pearl is determined in the same way as it would be for other "precious" gems. The valuation factors include size, shape, color, quality of

G. Historically, the world's best pearls came from the Persian Gulf, especially around what is now Bahrain. The pearls of the Persian Gulf were natural created and collected by breath-hold divers. The secret to the special luster of Gulf pearls probably derived from the unique mixture of sweet and salt water around the island. Unfortunately, the natural pearl industry of the Persian Gulf ended abruptly in the early 1930's with the discovery of large deposits of oil. Those who once dove for pearls sought prosperity in the economic boom ushered in by the oil industry. The water pollution resulting from spilled oil and indiscriminate over-fishing of oysters essentially ruined the once pristine pearl producing waters of the Gulf. Today, pearl diving is practiced only as a hobby. Still, Bahrain remains one of the foremost trading centers for high quality pearls. In fact, cultured pearls are banned from the

Bahrain pearl market, in an effort to preserve the location's heritage. Nowadays, the largest stock of natural pearls probably resides in India. Ironically, much of India's stock of natural pearls came originally from Bahrain. Unlike Bahrain, which has essentially lost its pearl resource, traditional pearl fishing is still practiced on a small scale in India.

Questions 1-4

Reading Passage I 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 ancient stories around the pearl and customers

2 Difficulties in cultivating process.

3 Factors can decide the value of natural pearls.

4 Different growth mechanisms that distinguish the cultured pearls from natural ones.

Questions 5-10

Complete the summary below.

Choose letter from A-K for each answer.

Write them in boxes 5-10 on your answer sheet.

In ancient history, pearls have great importance within the rich and rulers, which was treated as gem for women in 5……..... And pearls were even used as medicine and sex drug for people in 6. There are essentially three types of pearls: natural, cultured and imitation. Most freshwater cultured pearls sold today come from China while the 7..... is famous for its imitation pearl industry. The country 8……. usually manufactures some of the glitteriest cultured ones while the nation such as 9..... produces the larger sized pearl due to the favorable environment along the coast line. In the past, one country10……. of in Gulf produced the world's best pearls. Nowadays, the major remaining suppliers of the natural pearls belongs to India

A America

B Ancient Rome

C Australia

D Bahrain

E China

F Japan

G India

H Korea

I Mexico

J Persia

K Spain

Questions 1-4:

Which paragraph contains the following information?

1. **Ancient stories around the pearl and customers**
    - **Answer: A**
    - **Explanation:** Paragraph A discusses the historical significance of pearls, including their use by Roman women, their value to royalty, and medicinal uses in ancient Persia.
2. **Difficulties in cultivating process**
    - **Answer: E**
    - **Explanation:** Paragraph E explains the challenges of pearl cultivation, including the time required, the risk of oysters rejecting irritants or dying, and the low yield of high-quality pearls.
3. **Factors can decide the value of natural pearls**
    - **Answer: F**
    - **Explanation:** Paragraph F describes how the value of natural pearls is determined by factors like size, shape, color, and luster.
4. **Different growth mechanisms that distinguish the cultured pearls from natural ones**
    - **Answer: C**
    - **Explanation:** Paragraph C explains the difference between natural and cultured pearls, specifically how cultured pearls are created with implanted beads or shells.

Questions 5-10:

Complete the summary below.

In ancient history, pearls have great importance within the rich and rulers, which was treated as a gem for women in
5. **B (Ancient Rome)**

- **Explanation:** Paragraph A mentions that pearls were a favored gem of wealthy Roman women.

And pearls were even used as medicine and sex drug for people in
6. **J (Persia)**

- **Explanation:** Paragraph A mentions that in ancient Persia, pearls were ground into powders to cure diseases and were thought to have aphrodisiac properties.

Most freshwater cultured pearls sold today come from China while the
7. **K (Spain)**

- **Explanation:** Paragraph F mentions that the island of Mallorca in Spain is known for its imitation pearl industry.

The country
8. **F (Japan)**

- **Explanation:** Paragraph D highlights Japan's Akoya pearls as some of the most lustrous cultured pearls.

Usually manufactures some of the glitteriest cultured ones while the nation such as
9. **C (Australia)**

- **Explanation:** Paragraph D explains that Australia produces larger pearls due to nutrient-rich waters along its coastline.

In the past, one country
10. **D (Bahrain)**

- **Explanation:** Paragraph G discusses how Bahrain once produced the world's best pearls from the Persian Gulf.

READING PASSAGE 2

*Answer **Questions 17-32**, which are based on Reading Passage 2 on pages 6 and 7.*

The Global Effect of Food Systems

A Did you know that what's on your plate plays a larger role in contributing to climate change than the car you drive? Many people, especially in wealthier countries, are becoming worried about how much their individual carbon footprint is contributing to climate change. However, when they consider these issues, they'll usually think about what vehicle they drive and how much electricity they use in their home, but not so much about farming machinery, processed meals or food waste. Few consider the impacts of the food they eat, despite the fact that worldwide food systems account for roughly one quarter of all manmade emission of greenhouse gases. That's more than the entire global transportation sector.

B The most immediate threat from climate change for most of the global population will be at the dinner table, as our ability to grow critical staple crops is being affected by the global warming we've already experienced. Between 1980 and 2008, for instance, wheat yields fell by 5.5% and maize yields by 3.8% due to rising temperatures. Climate change threatens the food security of millions of poor people around the world. And yet what we see is that while food and agriculture are massively impacted by climate change, they are also, simultaneously, major contributors to it. What all of this tells us is that our food systems, as currently structured, are facing major challenges.

C So what are food systems? Everything from seed and soil, to the supermarket to the plate to the landfill site. Food systems include the growing, harvesting, processing, packaging, transporting, marketing, consumption and disposal of food and food-related items. While farming alone accounts for 10–12% of global greenhouse gas emissions, when we look at entire food systems the contributions to climate change more than double. A recent report published by the not-for-profit organisation Meridian Institute lays out the many factors throughout food systems that spell trouble for the climate, and also explains why a broad systems-wide perspective is necessary for implementing effective changes.

D Consider the impact of deforestation as forests are cleared for the purpose of making land available for other uses. Worldwide, 80% of deforestation is carried out to create farmland, with potentially serious consequences for climate change. The world's forests are massive carbon sinks, vital natural 'reservoirs' which remove carbon dioxide from the atmosphere and store it. So is soil, which locks away – or 'sequesters' – two to three times as much carbon as there is present in the atmosphere. However, there are ways to produce food without adding to climate change. Environmentally responsible farming can help restore ecosystem functions by producing crops and livestock in productive ways that sequester carbon and preserve forests.

E Or consider food waste. Not just the scraps that we throw away, but throughout the entire food system. Every year, a staggering 30–40% of the food produced in the world is never eaten. Some never gets harvested, some spoils before it reaches consumers, and a lot is tossed away by supermarkets, restaurants and at home. For the sake of comparing emissions, if food waste were a country in its own right, it would be the world's third largest contributor to global warming, after only China and the United States. This says nothing of the gross injustice of wasting so much food while so many in the world go

hungry. In the developing world, improving infrastructure along the food chain – including cold storage – would prevent much good food being lost. In the developed world, retailers can prevent large amounts of waste by finding outlets for slightly flawed or blemished goods, and consumers can limit waste by buying food in amounts they actually want and need.

F The complex, dynamic and widely diverse forms of the world's many food systems yield some wildly divergent outcomes in terms of nutrition, health, and environmental and climate impacts. Just as there's no universal crop that grows everywhere, there's no 'one size fits all' model food system to implement across the world. It is critical that we start to better examine what works in some systems and what must be improved in others, in order to produce more just and sustainable outcomes around the world. It's time to look beyond farming and agriculture and to see the whole picture, to create systems that cause less harm to the climate and are more resilient to the impacts we're already suffering from global warming. Food is a fundamental human need and to eat is a basic human right. Our food systems must deliver that need, without worsening the impacts of climate change.

Questions 17 – 22

Reading Passage 2 has six paragraphs, **A-F**.

Which paragraph contains the following information?

*Write the correct letter, **A-F**, in boxes 17-22 on your answer sheet.*

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

17 a figure indicating the environmental impact of agricultural practices

18 an outline of two basic aims which food systems need to achieve

19 an illustration of a drop in the amount of basic foodstuffs being produced

20 a mention of a lack of public awareness of how food systems affect climate change

21 a mention of the two-way relationship between farming and climate change

22 a reference to how food systems need to vary according to region

Questions 23 – 26

Complete the summary below.

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

Write your answers in boxes 23-26 on your answer sheet.

The public's perception of their contribution to climate change

People, especially in richer countries, are increasingly concerned about the impact of their personal **23** ..... on the environment. When thinking about how their lifestyles affect climate change, people tend to focus on the car they use or on the amount of **24** ..... that they consume. Not many people consider the environmental effects of what they eat, even though food systems are responsible for a large proportion of the **25** ..... being released. In fact, the impact of food systems exceeds the contribution to climate change of all **26** ..... throughout the world.

*Choose **TWO** letters, **A-E**.*

Write the correct letters in boxes 27 and 28 on your answer sheet.

Which **TWO** facts about forests does the writer mention?

A how the presence of forests benefits the environment
B the proportion of the world's forests which have been destroyed
C the principal reason for which forests are cut down
D the species of crops which have the potential to protect forests
E how long it will take to reverse the damage caused by forest clearances

Questions 29 and 30

*Choose **TWO** letters, **A-E**.*

Write the correct letters in boxes 29 and 30 on your answer sheet.

Which **TWO** facts about food waste does the writer mention?

A the countries in the world which waste most food
B the percentage of food which is wasted by retailers
C the total annual proportion of food wasted worldwide
D the impact of food waste on global warming
E the rate at which global food waste is increasing each year

Questions 31 and 32

*Choose **TWO** letters, **A-E**.*

Write the correct letters in boxes 31 and 32 on your answer sheet.

Which **TWO** solutions to the problem of food waste does the writer mention?

A selling products which have minor imperfections
B limiting the range of perishable goods on offer in retail outlets
C encouraging consumers to keep food for longer rather than discarding it
D shifting food production to countries whose inhabitants are undernourished
E increasing refrigeration facilities in poorer regions of the world

17. **D**

18. **F**

19. **B**

20. **A**

21. **B**

22. F

Questions 23–26: Summary Completion

23. **Impact**

24. **Electricity**

25. **Emissions**

26. **Transport**

Questions 27–28:

- **A**
- **C**

Questions 29–30:

- **C**
- **D**

Questions 31–32:

- **A**
- **E**

READING PASSAGE 2

Questions 14-19

Reading Passage 2 has seven paragraphs, A-F.

Choose the correct heading for each paragraph from the list of headings below. Write the correct number, i-viii, in boxes 14-19 on your answer sheet.

List of Headings

i. Opposition by employers to parental leave
ii. An illustration of a trend in one country
iii. An explanation for the limited success of government initiatives
iv. Pressure for change from an unlikely source
v. The need for cooperation at a global level
vi. The contrast in attitudes towards leave for mothers and fathers
vii. A range of measures to encourage more equal responsibility
viii. The implications of maternity leave

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

Paternity Leave

Men have long been discouraged from playing an equal role at home. That is at last starting to change.

A At a course for fathers-to-be in New York, participants are introduced to baby maintenance for beginners: how to keep their babies fed, warm and clean. The City Dads Group was founded when Matt Schneider and Lance Somerfeld
became fathers and discovered that people saw their place as firmly outside the home. New York was full of parents' support groups, but nearly all were aimed at mothers. Frustrated, the friends set up their own group, which has spread to 17 cities in the USA, helping fathers who want to get involved from day one.

B In general, legal and financial support for new parents is better than it has ever been. According to the International Labor Organization (ILO), 85% of countries now provide at least 12 weeks' maternity leave. In all but two of the 185 countries it surveys, mothers are entitled to some leave paid for by the state, companies or some combination of the two. Although only a third of countries meet the ILO's recommended minimum of at least 14 weeks off for new mothers, paid at two-thirds their salary and funded publicly, the picture is improving.

But how many countries meet the ILO's guidelines on paternity leave? None because no such **guidelines exist. Though it published detailed advice regarding female employees, the organization has drawn up no formal recommendations on fathers' rights and duties. Until recently, national governments have been similarly uninterested; less than half of countries offer **(missing part)** and companies, not the state, usually foot the bill for the costs of paternity leave. In the eyes of most people, responsibility for bringing up baby still falls squarely on the mother.

C Now a different view is slowly emerging, as growing evidence suggests that children benefit from seeing more of their fathers. But much of the demand for a shift in approaches to childcare has come from women, who have started to conclude that they are victims as well as beneficiaries of generous maternity-leave policies

D x This may appear paradoxical, as most countries have found that when they offer decent maternity leave, they increase female employment. If women have no right to take time off, or are entitled only to short or poorly paid spells of absence, many have little choice but to leave the workforce when their baby is born. If they can take a few months of paid leave before returning to their old job, they are more likely to continue working. But it turns out that long maternity breaks have unintended consequences. Time away from the labour market reduces women's earning power, as their skills degrade and they miss chances to gain experience and win promotion. Moving into senior management becomes particularly hard, partly because of discrimination by bosses and hiring committees, who reject candidates they think may be away a lot, and partly because many high-level jobs are hard to combine with serial leave-taking. And the effect is magnified when lengthy maternity leave is combined with policies to encourage part-time work, which tempt more women back into the labour force but help keep them in junior positions.

E Rather than simply cutting maternity leave in response to such findings, a growing number of governments are trying to spread the child-rearing burden (or joy, depending on how one looks at it). Britain recently became the latest country to combine maternity and paternity leave into a single chunk of parental leave, to be split between mother and father however they see fit. Several European countries, as well as Australia and New Zealand, already have such a system.

The problem is that dads tend not to take up the offer. In Austria, the Czech Republic and Poland, where all parental leave is transferable, only about 3% of dads make use of it. In Britain, the government estimates that 2-8% of dads will take more than their existing fortnight.

The main reason for low take-up by fathers is financial: even pre-childbirth, women are paid less than men, meaning that their salaries are easier to forgo during a period of unpaid or low-paid leave. But pressure related to culture also weigh heavily. Mothers still tend to be seen as the main carers, with dads portrayed in domestic terms as blundering sidekicks or well-meaning buffoons.

F To overcome these obstacles, some countries are giving fathers a firm nudge. In a few, including Chile, Italy and Portugal, paternity leave is compulsory. Others offer

incentives that are hard to turn down. Sweden grants a bonus to parents who share leave more equally.

Swedish fathers now account for more than a fifth of all parental leave taken, compared with almost none when shared leave was introduced. Germany introduced the same system and saw the proportion of fathers taking time off rise from 3% in 2006 to 32% in 2013, and Poland has switched to gender-specific quotas, replacing the previous system of shared leave.

Where leave is well-paid and not seen as 'belonging' to the mother, fathers seem willing to request it. State meddling in what has historically been regarded as a natural division of labour may annoy some people. But traditional maternity leave, which channels men into breadwinning and women into child-rearing, is hardly neutral. And shared involvement by parents stands to improve women's careers, children's development and perhaps even dads' life satisfaction.

Questions 20-21

Choose TWO letters, A-E

Write the correct letters in boxes 20 and 21 on your answer sheet.

According to the writer, which **TWO** problems may be caused by maternity leave?

A. women may be less effective at work after maternity leave

B. women may find it difficult to find suitable part-time work

C. women may find they are paid less for doing the same work

D. women's chances of professional advancement may be affected

E. women's pay may be insufficient to support them during maternity leave.

Questions 22-26

Complete the summary below.

Choose **ONE WORD ONLY** from the passage for each answer Write

your answers in boxes 22-26 on your answer sheet.

Encouraging more fathers to take paternity leave

Even in countries where paternity leave is easy to get, few fathers make use of it chiefly for 22 _____ reasons. However, issues connected with 23 _____, including traditional views of male and female roles in the family, may also play a part.

Some countries, such as Chile, have made it 24 _____ for men to take paternity leave. Sweden and Germany both offer a bonus to families where parents share leave, and in Poland, mothers and fathers each have 25 _____ of leave which are specified for them. Sharing children in this way may be good for both mothers and fathers and may also support the 26 _____ of the child.

Questions 14–19: Matching Paragraphs with Headings

14. **ii**
15. **iii**
16. **iv**
17. **viii**
18. **vii**
19. **vi**
20. **A**
22. **D Financial**
23. **Culture**
24. **Compulsory**
25. **Quotas**
26. **Development**

READING PASSAGE 1

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

The history of chicken

Short introduced project-based learning, which has given students more opportunities to ask questions and follow their interests. For one popular project—the Chicken Challenge— students investigate the driving question, "What's the most effective way to produce the best chickens for market in the least amount of time?" As they raise chickens in a school greenhouse, students conduct nutrition trials, do research, and prepare marketing materials to explain their approach. It's an academically rich project that also appeals to students' desire for hands-on learning. "There's the real life of caring for animals that rely on you," Short says.

The changes in her curriculum have made a difference. Enrollment in the school's agro program has doubled in 10 years, with girls now outnumbering boys in many classes. Technology has become an integral part of teaching and learning in a classroom equipped with a polymerase chain reaction machine and other real-world lab equipment for genetic studies. Interest has also spread to the junior high, where Short's STEM students are investigating the use of robotics in fishing lures and asking about using drones to gather data. "They're teaching me," she says, when it comes to emerging technologies.

A Growing Movement

Four of Short's students were among the 40,000 young people who gathered in Indianapolis in October for the National FFA convention. This annual event showcases the work of student researchers, FFA leaders, and young entrepreneurs, along with innovations developed by industry partners and technologists.

"We have more members now than at any point in history," says Blaze Currie, team leader for the leadership development team at FFA. The organization used to be known as Future Farmers of America but has rebranded to reflect a wider range of opportunities. "We still have students who come from rural communities, but we also have chapters in 18 of the 20 largest cities in the country."

Poor Office Lighting

Poor lighting (which includes light being too bright or creating glare) can cause us to lose our ability to focus through eyestrain, fatigue and headaches. This can result in lower productivity; absenteeism and a recent study by the HSE has shown that it also has an adverse effect on our daily moods. If you imagine sitting in an intensely lit room all day, squinting at another bright light; you can start to visualize how it might begin to affect you. Another condition associated with prolonged exposure to computer light is computer vision syndrome (CVS) or visual display unit (VDU) glare, affecting between 64% and 90% of the UK office population. While this hasn't been found to have any long

term complications, it can cause all the problems previously mentioned as well as dry eyes and temporary myopia (difficulty in seeing distant objects). Overhead lighting is generally fixed in the early phases of office development at an overly bright 500 lux, often over areas that do not need the light. After all, it's surely better to have too much light than not enough?

Questions 1-5

Do the following statements agree with the information given in the text?

In boxes 18-22 on your answer sheet, write

TRUE if the statement agrees with the information

FALSE if the statement contradicts the information

NOT GIVEN if there is no information on this.

1. This project can help build both academic knowledge and experimental learning.

2. There has been an increase in the number of student in the agri School where males have outnumbered females.

3. Children in Short's School has become more enthusiastic than before.

4. Four Shorts Students who took part in Indianapolis won awards.

5. Interest of urban student towards agricultural sector is increasing.

Questions 6-8

*Choose **NO MORE THAN THREE WORDS OR A NUMBER** from the text for each answer.*

6. The changes in ..... have brought a great change in the perspective of students.

7. Students have asked the teacher to use .....for data collection.

8. The future farmers of America program have appealed urban students with subject knowledge and .....skills.

Questions 9-13

Do the following statements agree with the information given in the text?

TRUE if the statement agrees with the information

FALSE if the statement contradicts the information

NOT GIVEN if there is no information on this.

9. Headaches are the common cause of loss of vision.

10. A person can develop negative psychology because of bad lighting.

11. Glare from computer screen has been commonly affecting UK population then other countries.

12. Difficulty seeing near objects can be a cause of poor lighting.

13. 500lux is the most desirable lighting

READING PASSAGE 3

You should spend about 25 minutes on Questions 27-40, which are based on Reading Passage 2 below.

Avalanche

Nature's destructive fury is unleashed on mountainsides around the world.

A) Hurtling down a mountainside at speeds of up to 300 kilometres an hour, an avalanche is at once both a terrifying sight and a spectacle of nature. The power of gravity pulls the snow mass down the mountain slope, capturing all in its path, from rocks, trees, and ice to, from time to time, human victims. Avalanches are caused by a wide range of factors, including the steepness of the mountainside, the weather, the terrain, the snowpack conditions and human activity. Avalanches occur in all parts of the world, in the northern hemisphere and the southern—wherever there are slopes steep enough for the snow to slide down, sometimes recording as much as 250,000 cubic metres of snow descending at unimaginable speeds and force, destroying all in its path.

B) An avalanche is an occurrence of nature whereby an entire layer of snow, or snowpack, separates naturally, or from human activity, and descends with rapid downward force, building up speed and air pressure ahead of it, with phenomenal destructive force. An avalanche has three main parts, the starting zone, the avalanche track and the runout zone. The starting zone is a volatile area of a slope where snow that is unstable can fracture and separate from the compacted snow and start to move downward. Usually, this occurs high up the slope of a mountain, but can happen anywhere there is a slope, and the usual cause is when the weight or force of the snow is greater than the strength holding it together. The avalanche track is the route the cascading snow follows, and is often a noticeable track following open or chute-like terrain, away from dense growths of trees, which indicates that other avalanches may have occurred, and often ending with large collecting areas where there is an abundance of debris, such as in gullies or flattened open areas. This is known as the runout zone, which is where the snow is usually piled the highest, with mounds of debris deposits.

C) There are three main types of avalanches: wet snow avalanches, dry snow avalanches and slab avalanches. Wet snow avalanches are often thought of as the least dangerous, usually occurring naturally in the spring season because of melting snow from the increasing temperatures. They are considered less dangerous because of the slow speed, due to friction, but can cause significant destruction because of their large mass. Water saturation is a key point, due to the melting, and they pull boulders, earth and vegetation with them. Dry snow avalanches are normally the largest, consisting of an enormous powder cloud masking huge volumes of a rapidly moving snowpack and occur at any time or for any reason. These avalanches can reach speeds of 300 km/hr, and can carry up to 10,000,000 tonnes of snow for incredibly long distances, and often uphill as they come to rest. Finally, some experts consider slab avalanches as the most dangerous, as a slab, or block, of snow separates from the main body of snow and cascades downward. A 'crown fracture' appears at the top and 'flank fractures' are created vertically, separating the block of snow which speeds downhill, destroying everything. Interestingly, these types of avalanches often leave

'walls' carved in the snow where the avalanche has broken away. Slab avalanches account for most related fatalities, and are often caused by human activity, notably skiers.

D) Other factors that can cause avalanches include natural conditions such as wind, weather, composition of the snow, storms, sunlight and moisture. Interestingly, coastal environments limit many of the dangerous aspects of mountainous conditions, with an ongoing stabilization of the snowpack due to a continuous freeze-thaw cycle moderating weather extremes. Very cold temperatures can also cause critical circumstances which give rise to avalanches, by affecting the stability of the snow pack, with differences in ground temperatures contrasting with the ambient air temperature, thus affecting moisture content, crystal formation and varying thicknesses of snow. Storms, be they rain or snow, lead to weight variations, with heavy precipitation on top, and less chance of snow bonding to secure a stable weight-load. And sunlight introduces a number of factors, melting, re-freezing and radiation loss which means significant variations in the heat/cooling process, which impacts on the stability of the snow pack.

E) So, what can be done to prevent, predict or control this unleashing of nature's destructive forces? In areas where avalanches present a major threat, such as mountainous communities, ski resorts and transportation facilities, there are a number of initiatives being introduced, because holding back Mother Nature has always been a long-held, but not always successful, dream. Explosives are regularly used in mountainous areas, armies being employed to fire high-decibal cannons which trigger shock waves to loosen snow packs, and other concussion devices dropped from helicopters or hand-launched. Protective fences can direct snow build-up to help prevent snow packs being formed, and there is often construction of avalanche dams to re-direct falling snow, or the building of earth mounds to slow the slide of avalanches. Lastly, to protect human life in the possibility of avalanche conditions, snow shelters have been constructed to withstand the impact of the force of snow, shielding human life, vehicle traffic and residential dwellings.

F) Avalanches cannot accurately be predicted, although the conditions can be monitored, studied and assessed. Snow and weather conditions, including temperature, wind and moisture, are a reliable guide, as well as human activity, recent history and forecasts of worsening conditions. However, unfortunately, disasters have occurred. And will continue so. During World War I, between 40,000 and 80,000 soldiers died in the mountainous regions of central Europe, in particular on the Austrian-Italian battlefields, and it has been determined that many were killed as a result of artillery fire, the concussive effects resulting in avalanches. Numerous ski resorts and their communities have unfortunately suffered devastating avalanches, notably in Turkey in 1993, when 43 climbers lost their lives, and in France in 1999, when 12 people were buried under 100,000 tonnes of snow, and in the same year, 31 people died in Austria in one avalanche.

G) There are various classification systems for avalanches, but none that is universally recognized. Canada and the United States use one system, defining risk levels using various factors, while Europe employs a different rating system with different criteria, and other alpine nations utilize varying systems which reflect different aspects of risk and outcomes. Avalanches pose a constant threat, and work is constantly being done to forecast, and mitigate, the risks and outcomes of avalanches. Survival is possible for those caught in this most terrible of natural circumstances, and future work and

investigation is vital to ensure the safety of those caught in one of nature's most destructive unleashings.

Questions 27-40

*Choose the most suitable headings for sections A – G from the list of headings below Write the appropriate numbers **i – ix** on your answer sheet.*

List of Headings

i The components which make up an avalanche.
ii Wide-ranging facts about avalanches.
iii Different systems at work to try to reduce risk and minimize loss.
iv The worse avalanches in history.
v Governments try to categorize different kinds of avalanches.
vi More factors that lead to avalanches.
vii Forecasting avalanches is not an exact science, and does not always prevent loss of human life.
viii What are governments doing to prevent the loss of human life?
ix What constitutes the different kinds of avalanches?

22 Paragraph A
23 Paragraph B
24 Paragraph C
25 Paragraph D
26 Paragraph E
27 Paragraph F
28 Paragraph G

Questions 34-37

Classify the following statements as characteristics of

*Write the appropriate letters **A – C** in boxes 21 – 24 on your answer sheet.*

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

A wet snow avalanches

B dry snow avalanches

C slab avalanches

29 Generally, there are two main parts to this type of avalanche.

30 This avalanche is common during one particular time of the year.

31 Specific lines demarcating the actual avalanche are formed when it is created.

32 One key point, moisture, is necessary to generate the force to cause the avalanche to break away and begin to move.

Questions 38-39

*Choose the appropriate letters **A – D** and write them in boxes 25 and 26 on your answer sheet.*

38. Measures to control avalanches include

A. large weapons being fired in mountainous areas to create huge sound waves to loosen the snow.

B. helicopters being used to blow the snow off mountainsides.

C. teams of men manually moving densely-packed snow away from inhabited areas.

D. avalanche dams stopping falling snow.

39. The classification systems for avalanches

A. in Canada and the United States differ according to the mountain regions.

B. are used to determine the possibility of an avalanche.

C. vary in different areas of the world.

D. use the European criteria to classify avalanches.

The history of chicken

Questions 1–5 (True/False/Not Given)

1. **TRUE**.
2. **FALSE**
3. **TRUE**
4. **NOT GIVEN**
5. **TRUE**.
6. **Curriculum**
7. **Drones**
8. **Leadership**
9. **FALSE**
10. **TRUE**

11.NOT GIVEN
12. TRUE
13. FALSE

Avalanche

27. ii
28. i
29. ix
30. vi
31. viii
32. vii
33. v
34. C
35. A
36. C
37. A
38. A
39. C

Candidate Number

Candidate Name _____

INTERNATIONAL ENGLISH LANGUAGE TESTING SYSTEM 0381/1

Academic Reading Pretest BP43

1 hour 15 minutes

Additional materials:
Answer sheets for Listening and Reading

Time 1 hour 15 minutes

INSTRUCTIONS TO CANDIDATES

Do not open this question paper until you are told to do so.
Write your name and candidate number in the spaces at the top of this page.
Read the instructions for each part of the paper carefully.
Answer all the questions.
Write your answers on the answer sheet. Use a pencil.
You **must** complete the answer sheet within the time limit.
At the end of the test, hand in both this question paper and your answer sheet.

INFORMATION FOR CANDIDATES

There are **46** questions on this question paper.
Each question carries one mark.

Your performance in this test will not be considered in connection with any examination.
Thank you for your help.

READING PASSAGE 1

*Answer **Questions 1-16**, which are based on Reading Passage 1 on pages 2 and 3.*

Amber

Amber is a yellowish semi-precious substance, formed in prehistoric times from the hardened and fossilised resin of coniferous pine trees. It has been used for thousands of years to make jewellery and other decorative objects, being relatively soft and easy to work. Amber can also be polished to produce an attractive gleam. One disadvantage is that it is susceptible to degradation, becoming cloudy as the colours gradually fade following exposure to air. For this reason, many amber artefacts do not look as impressive as they did when they were first made.

For the ancient world, the main source of amber was the Baltic region in northern Europe, on the eastern coast of the Baltic Sea, where pieces washed onto beaches and could be easily collected. Amber was sought after not only for its decorative appeal, but also because many thought that it gave protection against evil. For this reason, people in ancient Egypt and Greece wore or carried small ornaments known as 'amulets', and those made with amber were said to be among the most powerful. There was a belief it could cure mouth and throat complaints, and it was also ground and mixed with rose oil and honey to treat eye and ear infections. As amber naturally contains succinic acid, which was used in treatments prior to the use of antibiotics, this belief in its medicinal qualities was quite reasonable. The ancients also noticed that when rubbed, amber produced an electrical charge that drew other objects towards it. This ability to attract objects such as dried grasses led to the Persians calling amber *kahruba* or 'straw-robber'.

The ancient world also had popular myths about amber's origins, such as the story that it was the crystallised tears of a Greek goddess whose son was killed by a bolt of lightning. Colourful though such stories were, even people of the time may not have taken them too seriously, as writers such as the Greek philosopher Aristotle (384–322 BCE) had already correctly identified amber as a hardened resin. In addition, a number of myths about amber involved trees, indicating an awareness of its true origins.

In the 1st century CE, the Roman writer and philosopher Pliny the Elder classified precious stones and materials, including amber. He was dismissive of many earlier myths about it and acknowledged the fact that amber was collected from Baltic shores. He also agreed with assertions that amber originated from pine trees, writing that if amber was burnt, it smelled of pine. He also knew it originally existed in a liquid state because of the trapped insects sometimes seen inside larger pieces. He did not, however, grasp the concept of fossilisation, instead explaining the hardening of resin as a process performed by the sea.

The earliest evidence of people working with amber in the Baltic dates to the Neolithic period (approx. 6000–2200 BCE). But it was contact between the peoples of the Bronze Age (approx. 2200–800 BCE) that ensured amber spread across Europe, with various tribes trading pieces of amber and receiving metals in return. Amber was taken south from the Baltic via rivers to the Adriatic Sea, from where it was shipped to western Asia. Perhaps because of its rarity so far from its source, amber was particularly prized in this region, where it signified power and social standing for kings and queens. Priests were another group that wore amber

as a mark of distinction. Some amber beaded jewellery has been discovered in tombs in ancient Egypt, although finds here are uncommon.

During the Iron Age, the east coast of modern-day Italy became something of a specialist in amber. By the 9th century BCE, the coastal region of Verucchio had become an important manufacturing centre. Here, significant quantities of artefacts have been found, including amber discs for earrings and necklaces, and amber that would have been an embellishment for clothes that have disintegrated over time. The Etruscans, who flourished in central Italy between the 8th and 3rd centuries BCE, continued working with amber, creating fine jewellery and small figurines of animals and humans.

Although amber seems to have gone out of fashion during the Greek Classical period (500–300 BCE), it saw a resurgence in popularity during the Roman Empire (31 BCE – 476 CE). Aquileia, in central Italy, became a noted centre of production between the 1st and 3rd centuries CE. Amber workshops in this region produced many objects such as drinking goblets, which were sold for high prices to rich Romans for use in their homes. Its reputation as a protective talisman continued and it was widely used by Romans, in particular gladiators (men trained to fight in arenas for sport), who attached pieces of amber to their fighting equipment to ward off danger. The Romans' use of amber declined from the 3rd century CE, but it remained popular in the Baltic regions. In the medieval period, the Armenians became the new champions of amber, and ensured its trade and manufacture into fine decorative pieces continued into modern times.

Questions 9 – 16

Complete the notes below.

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

Write your answers in boxes 9-16 on your answer sheet.

Amber in the Ancient World

Bronze Age

Amber was:

- traded in exchange for various **9** .....
- transported through Europe along **10** .....
- used as a symbol of status by royalty and **11** ..... in western Asia

Iron Age

9th century BCE discoveries include:

- **12** ..... made of amber used in jewellery
- decorative pieces of amber, used on **13** ..... which have not survived
- amber ornaments made by the Etruscans in the shape of people and **14** .....

Roman Empire

- amber goods, e.g., **15** ..... were made for wealthy households
- many Romans, especially **16** ..... , used amber to keep themselves safe

Bronze Age

9. **metals**
   (Amber was traded in exchange for metals, as stated in the passage.)

10. **rivers**
    (Amber was transported through Europe along rivers.)

11. **kings**
    (Amber was used as a symbol of status by royalty and kings in western Asia.)

Iron Age

12. **earrings**
    (The passage mentions earrings made of amber used in jewellery.)

13. **clothes**
    (Decorative pieces of amber were used on clothes, but these have disintegrated over time.)

14. **animals**
    (Amber ornaments made by the Etruscans were in the shape of people and animals.)

Roman Empire

15. **goblets**
    (Amber goods such as goblets were made for wealthy households.)

16. **gladiators**
    (Amber was used by gladiators to keep themselves safe.)

READING PASSAGE 1

You should spend about 20 minutes on **Question 1-13,** which are based on Reading Passage 1 on pages 2 and 3.

Coffee then and now

Coffee originated around the Red Sea, most probably in Africa, and there are records of coffee cultivation in Yemen as early as the 6th century. By the 13th century, the growing, roasting and grinding of coffee to make a strong-flavoured infusion was widespread throughout the Arab world. News of the drink was bought to Europe by traders, but people there were at first wary of the new drink. However, Pope Clement the Eighth gave the drink his seal of approval after trying a cup for himself, and the trend quickly caught on. The 17th century saw the spread of coffee drinking throughout Europe. Coffee houses opened in Vienna, Pahs and London, and they soon became the favourite meeting places of politicians, and were also known to attract artists of all kinds. By the 18th century, coffee production was well established in Java in Indonesia and also throughout the Caribbean. Coffee drinking continued to grow in popularity; one of the repercussions of the famous Boston Tea Party of 1773 was that the USA adopted coffee as its national beverage. Today, coffee is drunk around the world, though each nation has its own ways of preparing and serving it.

Coffee is now grown in more than 50 countries, although production is not at all straightforward. Because it is vulnerable to frost, coffee can only be grown successfully between the Tropics of Cancer and Capricorn. In addition, crop maintenance is labour intensive. The plants require constant care and attention, and in most areas the picking is carried out by hand.

The ripe berry-like fruits which are harvested are called ‘cherries’. These ripen over a period of six to eight months and turn a deep red when ripe, which explains their name. Inside there are two green beans that have to be separated from the pulp and the skin, and dried. This process is known as curing, and it can be done by one of two methods. For the traditional ‘dry method’ of curing, the cherries are laid out in the sun until completely dry, and then the dried skins and pulp are removed from the beans. The ‘wet method’ is a more recent development and it is employed for high-quality hand-picked cherries. The outer, fleshy layer is removed, then the cherries are soaked and fermented, followed by washing and drying. Finally, the skins are removed by a machine, revealing the green beans.

In both cases, the green beans are sorted, graded and packed for export. Roasting tends to be done in the country of import. The roasting process is necessary to reduce the acidity of the beans and to develop the aromatic oils, which give the coffee its aroma and flavour. Finally, grinding exposes a larger surface area to the water, ensuring optimum contact between the ground beans and the water, resulting in a more satisfying cup of coffee.

The flavour, character and quality of coffee varies tremendouslv - not only between countries, but also between estates within the same country. The soil, altitude and climate are all factors that contribute to the character of the bean, thereby affecting the final taste. There are four varieties of coffee plant, but only two are sold on any commercial scale.
The most important of these is coffee arabica, which grows on steep mountain slopes at high altitudes. The arabica bean produces coffee that is rich, aromatic and full of flavor, and it accounts for 70% of world coffee production. Coffee experts agree that the arabica bean is far superior in flavour to other types. The other main variety, coffee canephora, produces the coffee bean known as robusta. Grown on the lower slopes, where cultivation is easier, robusta beans have a higher caffeine content than arabica beans, and a rougher, almost earthy flavour that lacks delicacy and subtlety. It costs about half the price of arabica and is used in the cheaper blends of both fresh and instant coffee.

There are three types of instant coffee. The cheapest is made from robusta beans that have been brewed into a concentrate. This is sprayed into a stream of hot air that instantly evaporates all moisture, leaving a fine powder. Some of the spray-dried powders undergo further heating to produce granular coffees; the better ones include some arabica beans. The best instant coffees are freeze-dried. For these, an arabica coffee concentrate is frozen and processed in a vacuum to produce crisp, dry particles of coffee.

Caffeine is a stimulant that is present in coffee. It makes the nervous system more active, which is usually the desired effect. However, it can cause sleeplessness and therefore some consumers prefer to buy coffee without caffeine. Decaffeinated coffee is available in all the regular coffee forms: whole beans, ground or instant. Caffeine is removed by soaking the beans in water, or by the use of solvents or carbon dioxide. The latter is thought to be the best method as it does not affect the flavour and there is no residue. To qualify as decaffeinated, coffee must contain less than 0.9% caffeine.

Questions 1 - 6

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

In boxes 1 -6 on your answer sheet, write

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

1 Ripe coffee fruits are called cherries because of their colour.

2 The modern 'wet method' of curing is more efficient than the old 'dry method'.

3 Green beans are usually roasted before being exported.

4 The roasting process improves both the smell and the taste of coffee.

5 Arabica coffee is harder to grow than robusta coffee.

6 The best instant coffee is a mix of arabica and robusta coffee.

Questions 7 - 13 Complete the notes below.

Choose **ONE WORD ONLY** from the passage for each answer. Write

your answers in boxes 7-13 on your answer sheet.

The history of coffee

- coffee originally came from the area around the Red Sea
- early **7** ..... suggest that coffee was grown in Yemen
- Europeans first heard about coffee from 8 .....
- coffee drinking became a **9** ..... in Europe only after Pope Clement VIII drank some of it
- people such as painters and 10 ..... began to get together in cafes in major European cities
- today coffee is grown only in tropical regions to avoid damage caused by **11** .....
- in coffee cultivation, the 12..... is generally done manually

Decaffeinated coffee

- most people like the fact that coffee contains a stimulant, but this leads to problems for others
- using carbon dioxide is the ideal way of removing caffeine because it maintains the **13**.....of the coffee

1. TRUE
2. NOT GIVEN
3. FALSE
4. TRUE
5. TRUE
6. FALSE
7. records
8. traders
9. trend
10. politicians
11. frost
12. picking
13. flavor

READING PASSAGE 3

You should spend about 20 minutes on Questions 27-40, which are based on Reading Passage 3 on pages 10 and 11

The peopling of Patagonia

Anthropologists continue to investigate human migration to Patagonia at the southern tip of South America

The human settlement of the southern extremity of the Americas has always fascinated pre-historians. Viewed from a global perspective, this was the last major continental land mass to be reached by human beings. The earliest occupation of Patagonia carries obvious implications for understanding when the North and South American continents were peopled, because it gives a baseline that all calculations regarding the rate of dispersion of humans throughout both continents must take into account.

For many years the human settlement of North and South America has been conceived of as beginning in the far north and travelling progressively southwards to Patagonia. However, fundamental disagreements developed concerning the length of time involved Some scholars accepted a human presence in the Americas as early as 20,000 years ago, while others proposed that it could date no earlier than 8,000 years ago, and the debate is still with us today. The idea of a relatively 'late' settlement of the Americas (around 8,000 years ago) implies that are rapid process of migration took place. Herein lies a second debate which revolves around the question of how migration is to be understood. The "late" model demands a hypothetical migration conceived of as a single, continually advancing wave of settlement. This has always been difficult to take seriously and many scholars now support the idea of an 'early' model that sees the migration as a less ordered migration, and this is surely the most realistic scenario as migrants slowly adapted to the diverse natural habitats they would have met while travelling through the continent.

Those who argue for an earlier settlement, however, must contend with the lack of unequivocal evidence for archaeological sites older than around 14,000 years.
Nevertheless, evidence for human occupation of the center of South America is now securely dated 10 around 12,500 years ago at the Monte Verde site, which easts doubt on the 'late model'. The lack of archaeological evidence further south for this time period may

be explained by the obstacle to humans on foot posed by the huge glacial streams that were present at that time.

We can speculate then that the retreat of the Patagonian glaciers around 14,000 years ago allowed the initial human intrusion into a pristine environment, which was similar to that of early post-glacial Europe. Human settlement of the vast horizontal expanse of treeless high country must have been tenuous at best, and the evidence for this occupation remains relatively scant, most of it coming from rock shelters in Argentina and Chile. There is, however, reliable evidence from these sites to confirm the presence of humans by around 11,000 years ago in different habitats, and some hints of an even older occupation

However, some other sites where evidence for even earlier human occupation was initially posited. have recently come under fresh scrutiny. "This is because anthologists have come to recognize that bones or other evidence may be deposited in caves by natural agency, in other words by other forces such as floods or predators, and not necessarily by humans.

'We shall tum now to a more detailed discussion of the archaeological evidence found in various parts of Patagonia. At the site located beside Chinchihuapi Creek. excavations have produced convincing evidence of human occupation, including hut foundations and wooden artefacts 'They were buried in layers of peat, which has the property of preserving wood remarkably well,

'tudtadhavesbioradiheachuefatisgo date from around 12,500 'years ago. One of the most famous Patagonian sites is a cave known as Los Toldos.

However, the evidence from this site has recently been called into question, because dispersed flecks of carbon used in the test process were taken unsystematically from many different places in the site. As a result, the association of this material with the artefacts is not at all clear. About 150 kilometers south is the site called El Ceibo, whereas similar collection of artefacts to that found at Los Toldos has been discovered from the lowest levels of the dig, but as yet no radiocarbon dates are available and this sort of analysis of the existing evidence is requited before the site's value can be confirmed.

the Arroyo Eeo site is located very close to the high plateau, I he artefacts from the earliest 'occupations were found at the same depth and have the same origins as those from Los Toldos, and have been securely dated to around 9,000 years ago. Another site that is

mentioned in the debate is at Las Buitreras, where a number of stone flakes associated with bone remains of various animals have been discovered. However, anthropologists now believe that presumed cut marks on the bones are somewhat dubious, and despite detailed testing there is no way of securely relating any of these remains with human

occupation, Finally some 50 kilometers to the south is the site al Cueva Fell, which was the

first Patagonian site to be systematically studied by modern archaeological methods. However, it is now recognized that the utility of this site must be restricted to its direct vicinity. given changes to the nearby area caused by flooding, and
findings cannot be freely extrapolated further afield.

In conclusion, based! on the evidence from a number of reliable sites, it seems probable that human populations reached Patagonia around 11.000 years ago.

Questions 27-31

Choose the correct letter, A, B, c or D.
Write the correct letter in boxes 27-31 on your answer sheet

27 In the first paragraph, what is the writer's main point about migration to Patagonia?
A It started earlier than previously thought.
B Historians have overlooked its importance,
C It impacts on research into the wider region,
D Researchers have calculated its effects on the environment.

28 In the second paragraph, what is the writer's purpose?
A to challenge previous research.
B to propose new areas to investigate.
C summarize a scholarly debate
D to suggest reasons for human migration

2G The writer refers to the Tate' model in order to
A compare it with another theory of migration
B evaluate the success of American migration,
C criticize the speed of research into migration
D compare migration in different parts of the world.

30 What is the writer's main point about the 'early' model?
A Scholars support the idea of fast migrations,
B It is too random to be a convincing theory.

C South America was more habitable at an earlier time
D it is more consistent with the physical conditions of the land.

31 What does the writer suggest about the Monte Verde site?
A it is much younger than researchers once estimated.
B It provides supporting evidence for relatively early settlement,
C Archaeologists believe the site is of questionable value.
D Streams exposed the site, making new research possible.

Questions 32-35

Do the following statements agree with the claims of the writer in Reading Passage 3? In boxes 32-35 on your answer sheet, write

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

32 The conditions encountered by the first migrants to Patagonia were unique.
33 In the high country the first migrants hunted wild animals for food.
34 Archaeologist have failed to draw conclusions from the evidence found at rock shelters in Argentina and Chile.
35 Archaeological evidence can be moved from place to place in a variety of ways.

Questions 36-40
Complete the summary using the list of words and phrases, A-J. below. Write the correct letter, A-J, in boxes 36-40 on your answer sheet.
The archaeological evidence from Patagonia

Building remains and other evidence have been found in 36..... at the Chinchihuapi Creek site, and because of this it has been possible to date them to around 12,500 years ago. However, the 37 ..... of the samples taken from Los Toldos means that this site is of doubtful value. El Ceibo is a more promising dig, where the examination of artefacts would be beneficial in order to confirm the usefulness of discoveries there. The remains found at

the Arroyo Feo site show 38. and date from around 9,000 years ago. Unfortunately no 39.....can be made between the samples taken from Las Buitreras and human presence. The findings of the work carried out at Cueva Fell cannot provide useful information
beyond the 40 ..... In conclusion, though the evidence is mixed, it is believed that human population of Patagonia began about 11,000 years ago.

A fixed date
B random collection
C similar properties
D good condition
E scientific evaluation
F huge quantities
G new samples
H reliable connection
I skilled preservation
J. immediate surroundings

27 C
28 C
29 A
30 D
31 B
32 NO
33 NOT GIVEN
34 NO
35 YES
36 D
37 B
38 C
39 H
40 J

READING PASSAGE 1

*Answer **Questions 1-13**, which are based on Reading Passage 1 on pages 2 and 3.*

The continuing saga of the Galápagos Finches

Galápagos finches, the island birds that helped shape Charles Darwin's theory of evolution, are giving scientists new insights into how natural selection works

In 1835, naturalist Charles Darwin arrived on the Galápagos islands off the Pacific coast of South America. Observation of the islands' many different species of finches inspired his revolutionary theory of evolution, and set him on the quest that would consume him for the rest of his life: the struggle to understand how new species come into being.

Today, that quest continues. On Daphne Major – one of the most desolate of the Galápagos Islands – biologists Peter and Rosemary Grant have spent more than three decades watching Darwin's finches respond to the challenges of storms, drought and competition for food. They know and recognise many of the individual birds on the island and can trace the birds' lineages back through time. They have witnessed Darwin's principle in action again and again, over many generations of finches.

The Grants' most dramatic insights have come from watching the evolving bill (hard mouth part) of the medium ground finch (*geospiza fortis*). Its bill is a middling example in the array of shapes and sizes found among Galápagos finches: larger than that of the small ground finch (*geospiza fuliginosa*), which specialises in eating small, soft seeds, but not as big as that of the large ground finch (*geospiza magnirostris*), an expert at cracking and devouring big, hard seeds.

When the Grants began their study in the 1970s, only two species of finch lived on Daphne Major – the medium ground finch and the cactus finch (*geospiza scandens*). When a severe drought hit in 1977, the last of the small seeds were soon devoured, and the members of the medium ground finch population who lacked the bill strength to crack large seeds soon died out. Bill and body size are inherited traits, and the next generation of medium ground finches had a high proportion of individuals with large bills. The Grants had documented natural selection at work.

Eight years later, in 1985, heavy rain transformed the normally meagre vegetation on Daphne Major. Vines and other plants that in most years struggle for survival suddenly flourished, choking out the plants that provide large seeds for the finches. Small seeds came to dominate the food supply, and medium ground finches with small bills dominated the next generation to be born.

More recently, the Grants witnessed another form of natural selection acting on the medium ground finch: competition from bigger, stronger cousins. In 1982, the large ground finch (*geospiza magnirostris*) came to live on Daphne Major. Over the next 20 years the two species coexisted, with the medium ground finch sharing its supply of large seeds with the bigger-billed newcomer. Then, in 2002 and 2003, there was another drought. None of the birds nested that year, and many died out. Medium ground finches with large bills, crowded out of feeding areas by the more powerful large ground finches, were hit particularly hard. When wetter weather returned in 2004, and the finches nested again, the new generation of medium ground finches was again dominated by birds with smaller bills, able to survive on smaller seeds. This situation, says Peter Grant, marked the first time that biologists have been able to follow the complete process of an evolutionary change due to competition between species.

On the island of Santa Cruz, just south of Daphne Major, Andrew Hendry of McGill University and Jeffrey Podos of the University of Massachusetts at Amherst have discovered a new, man-made twist in finch evolution. Their study focused on birds living near the Academy Bay research station, on the fringe of the town of Puerto Ayora. The human population of the area had been growing fast since the late 1960s.

Academy Bay finch records dating back to the early 1960s show that medium ground finches captured there had either small or large bills. Very few of the birds had medium bills. The finches appeared to be in the early stages of a new adaptive radiation: if the trend had continued, the medium ground finch on Santa Cruz could have split into two distinct subspecies specialising in different types of seeds. But in the late 1960s and early 70s, medium ground finches with medium bills began to thrive along with small- and large-billed birds. The townspeople had introduced new food sources, such as rice, which they put in bird feeding stations. Bill size, once critical to the finches' survival, no longer made any difference.

At a control site on Santa Cruz, distant from Puerto Ayora, and relatively untouched by humans, Hendry and Podos noted that the medium ground finch population remained split between large- and small-billed birds. On such undisturbed parts of the island there is no ecological niche for a medium-billed bird, and the birds continue to diversify. In town, however, once-distinct populations of finches are merging.

The finches of Santa Cruz demonstrate a subtle process in which human meddling can halt evolution in its tracks, ending the formation of new species. In a time when global biodiversity continues its downhill slide, Darwin's finches have yet another unexpected lesson to teach. 'If we hope to regain some of the diversity that's already been lost,' Hendry says, 'we need to protect not just existing creatures, but also the processes that drive the origin of new species.'

Questions 1 – 8

Complete the table below.

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

Write your answers in boxes 1-8 on your answer sheet.

Location and year	Occurrence	Resulting change to food supply	Impact on next generation of medium ground finches
Daphne Major, 1977	Drought	Shortage of **1**	More birds with **2** .....
Daphne Major, 1985	Dense vegetation caused by unusually **3**	Lack of plants producing **4**	Domination of birds with **5** .....
Daphne Major, 2002 – 2003	**6**	Competition for food from immigrant finch species	Higher proportion of birds with smaller bills
Santa Cruz, late 1960s onwards	Rapid expansion of the human population	Introduction of new foods, eg **7** ..... at bird feeding stations	Increase in number of birds with **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 agrees with the information*
FALSE	*if the statement contradicts the information*
NOT GIVEN	*if there is no information on this*

9 The Grants' observations brought Darwin's ideas into question.

10 The Galápagos cactus finch is less affected by variations in food supply than the medium ground finch.

11 All types of ground finches on Daphne Major were affected by the adverse weather conditions in 2002 and 2003.

12 Hendry and Podos observed the same changes in finch population throughout the island of Santa Cruz.

13 There is evidence to suggest that the course of species diversification on Santa Cruz has been altered.

1. Small seeds
2. Large bills
3. Heavy rain
4. Large seeds
5. Small bills
6. Drought
7. Rice
8. Medium bills
9. False
10. Not Given
11. True
12. False
13. True

READING PASSAGE 3

*Answer **Questions 30-46**, which are based on Reading Passage 3 on pages 10 and 11.*

Video Games

Video games are one of the most misunderstood forms of entertainment. In one sense, it's easy to see why: if you haven't had much interaction with them, watching someone play one can be a pretty unsettling experience. Gamers can often give the impression that they're glued to the screen, absorbed in the digital equivalent of junk food. However the reality is somewhat more complex.

For example, a long-standing claim is that violent games can cause players to become more aggressive in the real world. Video games often take centre stage in the constant media analysis of acts of aggression, with claims that not only do violent people play violent games, but that they were driven to some act of aggression because they play games.

Such accusations often fall flat in the face of subsequent forensic analysis. In one recent study participants were asked to play a violent game, a non-violent game, or no game at all, every day for two months. The study's authors found that playing the violent video game had no significant negative effects. One study doesn't give the whole story, of course. However, the emerging picture from the research literature is that video games certainly aren't the root cause of mass acts of societal violence.

Another claim relates to addiction. Recently, the World Health Organization (WHO) formally included 'gaming disorder' in its diagnostic manual, the International Classification of Diseases, for the first time. It was a decision that ignited a furious debate in the academic community. One group of scholars argued that such a diagnostic label would provide greater access to treatment and financial help for those experiencing genuine harm from playing video games. Others argued that the scientific evidence for gaming addiction simply wasn't accurate or meaningful enough.

Part of the problem lies in the checklists used by the WHO to determine whether a disorder exists. The criteria for gaming addiction are derived from those used for other sorts of addiction. While that might be a reasonable place to start, it might not tell us the whole story about what the unique aspects of gaming addiction look like. For example, one of the standard criteria is that people become preoccupied with games, or start playing them exclusively, instead of engaging in other hobbies. However, this criterion doesn't sit very well as a benchmark for what you might consider to be 'harmful' engagement, because unlike many other addictions, games are not in themselves harmful. Also, using this as a criterion has the potential to exaggerate how widespread addiction is. While there will be people out there for whom gaming can become problematic, the chances are that this is a small group.

Moreover, results from a recent research project suggest that gaming addiction is fairly short-lived. Data looking at players over a six-month period has shown that not one of those who initially exhibited the diagnostic criteria for addiction did so by the end of the study.

Another issue is social isolation. The stereotypical view of a gamer is a heavy-eyed, pale-faced teenager playing alone in their bedroom. It's understandable that something about that situation seems unhealthy or unnatural. But this view usually comes from a misunderstanding of what video games really are. From their initial inception, the aim of video games was to provide

social experiences. Whereas in the first 30 or so years of their existence this was restricted to people playing multiplayer games in person, the advent of high-speed internet access means increasingly that these interactions are moving online. Rather than isolating people, online gaming has the potential to unite people in many new ways and to form close-knit communities based around common interests and hobbies.

Another criticism aimed at video games is that they're a meaningless waste of time. There's a certain illogicality to the notion, in a way: somehow, we are able simultaneously to worry that games are the root cause of many societal ills, yet also consider them to be pointless. Why play them when you could go outside, or engage in more culturally fulfilling art forms? But this comes from a misunderstanding about the creative power that games possess.

As novelist and games designer Naomi Alderman outlined in a 2013 radio essay: 'While all art forms can elicit powerful emotions, only games can make their audience feel the emotion of agency. A novel can make you feel sad, but only a game can make you feel guilty for your actions.' Video games place you at the centre of the story as an active participant. Games help us explore what it means to be human, allow us to travel to far-off incredible places, to become incredible people – all from the comfort of our own home.

Finally, video games are more than purely entertainment. Now, in part because of their power to draw us in, video games are actually being utilised in the course of scientific study. The best examples achieve two things: they act as fertile ground for gathering valuable scientific information, while at the same time providing an exciting gaming adventure.

An example of this is the recent mobile game *Sea Hero Quest*. Players are tasked with memorising a map, and then navigating a fishing boat around a series of waterways, visiting a set of buoys in a specific order. The information gleaned from this is being used by scientists to understand how spatial navigation abilities change between childhood and old age. The research can also be used to examine differences across the globe. This sort of knowledge is crucial in developing a deeper understanding of how such abilities start to decline in neurodegenerative disorders like Alzheimer's disease. The hope is that this information will help inform innovative methods in diagnosing and treating dementia.

Questions 30 – 35

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

In boxes 30-35 on your answer sheet, write

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

30 People who don't play video games may regard them as harmful.

31 The media put forward the view that video games are linked to violence in society.

32 Forensic analysis supports the claim that video games can have a bad influence on the behaviour of their players.

33 The method of selection of participants for one recent study was questionable.

34 Results from a recent research project indicate that gaming addiction tends to last for six months.

35 The 'social isolation' view of gamers is the most recent to emerge.

Questions 36 – 41

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

Write the correct letter in boxes 36-41 on your answer sheet.

36 The writer says that the formal recognition of gaming disorder as addictive by the WHO

- **A** was welcomed by most experts.
- **B** led to a heated exchange of views.
- **C** meant that some gamers were able to get help.
- **D** resulted in a move to reclassify certain games.

37 What problem does the writer identify with the WHO checklists used in determining gaming addiction?

- **A** They require a great deal of administration.
- **B** They are confusing for those who refer to them.
- **C** They are too wide-ranging to be effective.
- **D** They can, in themselves, make addicts anxious.

38 What does the writer say about one of the criteria used by the WHO?

- **A** It is likely to lead to people being labelled addicts unnecessarily.
- **B** It ought to be slightly reworded to improve clarity.
- **C** It includes a definition that experts have questioned.
- **D** It may well be removed when the rules are next updated.

39 What point is the writer making in the seventh paragraph?

- **A** Video game designers have unknowingly contributed to a problem.
- **B** Technological developments have produced improved versions of games.
- **C** Video games have always been intended to bring people together.
- **D** Some video gamers create closed groups that are inward-looking.

40 In the writer's view, if video games are seen as a waste of time, then

- **A** so are some supposedly more healthy outdoor activities.
- **B** so are many apparently more enriching art forms.
- **C** they are not worthy of so much critical attention.
- **D** they cannot also be at the heart of society's problems.

41 The writer quotes Naomi Alderman in order to make the point that video games

- **A** develop certain undesirable emotions.
- **B** involve the user in a unique way.
- **C** improve our feelings of empathy towards others.
- **D** show how to overcome negative emotions.

Questions 42 – 46

Complete the summary using the list of phrases, ***A-I****, below.*

Write the correct letter, ***A-I****, in boxes 42-46 on your answer sheet.*

The use of video games in scientific study

Video games can be both a very **42** ..... for players and a way for scientists to collect **43** ..... . For example, the game *Sea Hero Quest* is being used to help scientists research spatial navigation skills over a **44** ..... , as well as investigating the **45** ..... in these skills. Such knowledge can then be applied to certain brain disorders and enable scientists to come up with a **46** ..... towards curing patients.

A	controversial method	**B**	new approach	**C**	stimulating experience
D	initial feedback	**E**	international variation	**F**	typical lifetime
G	definite proof	**H**	useful data	**I**	systematic analysis

Questions 30–35: Do the following statements agree with the claims of the writer?

30. People who don't play video games may regard them as harmful.

- **Answer: YES**
- **Explanation:** The passage mentions that video games are "misunderstood" and that people unfamiliar with them perceive gamers as "absorbed in the digital equivalent of junk food," which implies a perception of harm.

31. The media put forward the view that video games are linked to violence in society.

- **Answer: YES**
- **Explanation:** The passage states, "Video games often take centre stage in the constant media analysis of acts of aggression," showing that media links video games to societal violence.

32. Forensic analysis supports the claim that video games can have a bad influence on the behaviour of their players.

- **Answer: NO**
- **Explanation:** The text explicitly states, "Such accusations often fall flat in the face of subsequent forensic analysis," showing that forensic analysis does not support this claim.

33. The method of selection of participants for one recent study was questionable.

- **Answer: NOT GIVEN**
- **Explanation:** Although a study about violent and non-violent games is mentioned, there is no discussion about the method of participant selection.

34. Results from a recent research project indicate that gaming addiction tends to last for six months.

- **Answer: NOT GIVEN**
- **Explanation:** The passage discusses gaming addiction and the WHO's criteria, but it does not mention that it lasts for six months.

35. The 'social isolation' view of gamers is the most recent to emerge.

- **Answer: NO**
- **Explanation:** The passage presents the "social isolation" view as a long-standing misconception, not a recent one.

Questions 36–41: Choose the correct letter, A, B, C, or D.

36. The writer says that the formal recognition of gaming disorder as addictive by the WHO

- **Answer: B (led to a heated exchange of views).**
- **Explanation:** The text mentions that the WHO's decision "ignited a furious debate in the academic community," showing a strong exchange of views.

37. What problem does the writer identify with the WHO checklists used in determining gaming addiction?

- **Answer: C (They are too wide-ranging to be effective).**
- **Explanation:** The writer criticizes the WHO's checklist for not being a reliable benchmark, as it might overgeneralize and label non-problematic gaming as harmful.

38. What does the writer say about one of the criteria used by the WHO?

- **Answer: A (It is likely to lead to people being labelled addicts unnecessarily).**
- **Explanation:** The passage states that the WHO's criteria "have the potential to erroneously label individuals as addicted," which aligns with this option.

39. What point is the writer making in the seventh paragraph?

- **Answer: C (Video games have always been intended to bring people together).**
- **Explanation:** The text explains how video games create opportunities for social connections, particularly with the advent of online gaming.

40. In the writer's view, if video games are seen as a waste of time, then

- **Answer: B (there are many apparently more enriching art forms).**
- **Explanation:** The passage mentions that video games are seen as a waste of time compared to "more culturally fulfilling art forms."

41. The writer quotes Naomi Alderman in order to make the point that video games

- **Answer: B (involve the user in a unique way).**
- **Explanation:** Alderman's quote highlights how games allow players to feel "agency" and be active participants, which is a unique characteristic of video games.

Questions 42–46: Complete the summary using the list of phrases A-I.

The use of video games in scientific study
Video games can be both a very 42 _____ for players and a way for scientists to collect 43 _____.

- **42. C (stimulating experience)**
  - **Explanation:** The passage describes video games as engaging and capable of providing exciting adventures for players.
- **43. H (useful data)**
  - **Explanation:** The example of *Sea Hero Quest* shows how video games are used to collect scientific information.

For example, the game Sea Hero Quest is being used to help scientists research

spatial navigation skills over a 44 _____, as well as investigating the 45 _____ in these skills.

- **44. F (typical lifetime)**
  - **Explanation:** The research tracks how spatial navigation changes "between childhood and old age," indicating a focus over a lifetime.
- **45. E (international variation)**
  - **Explanation:** The passage discusses understanding the decline of spatial navigation abilities, suggesting differences across groups (potentially geographic or demographic).

Such knowledge can then be applied to certain brain disorders and enable scientists to come up with a 46 _____ towards curing patients.

- **46. B (new approach)**
  - **Explanation:** The research aims to develop innovative methods for diagnosing and treating brain disorders like Alzheimer's disease.

IELTS Advanced
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Candidate Number

Candidate Name _____

INTERNATIONAL ENGLISH LANGUAGE TESTING SYSTEM

Academic Reading

1 hour

Additional materials:
Answer sheet for Listening and Reading

Time 1 hour

INSTRUCTIONS TO CANDIDATES

Do not open this question paper until you are told to do so.

Write your name and candidate number in the spaces at the top of this page.

Read the instructions for each part of the paper carefully.

Answer all the questions.

Write your answers on the answer sheet. Use a pencil.

You **must** complete the answer sheet within the time limit.

At the end of the test, hand in both this question paper and your answer sheet.

INFORMATION FOR CANDIDATES

There are **40** questions on this question paper.

Each question carries one mark.

READING PASSAGE 1

You should spend about 20 minutes on ***Questions 1-13,*** *which are based on Reading Passage 1 on pages 2 and* 3.

Proto-writing

Introduction
'Complete writing' has been defined as a system of communication consisting of marks on a durable or electronic surface, relating to articulate speech. Before writing existed, humankind made use of a wealth of graphic symbols and mnemonics (memory tools) in order to store information. All of these systems possessed at least some of the characteristics of writing, but none possessed them all. Together, they are known as 'proto-writing'; pictographs are one example, as are knot records, notched sticks or bones, and coloured pebbles.

Pictography
Perhaps deriving from systems such as notched sticks, pictorial messages were being recorded tens of thousands of years ago. Rock art, for example, constitutes a collection of universal representations: human-like figures, plants, animals, the sun, stars, and many geometric designs. For the most part, these were graphic representations of the most common phenomena of the physical world, and can be regarded as stored information. This form of art is found in caves in Africa and Australia, and in many other areas.

In recent years, the pictography of Native Americans has attracted a great deal of attention. Their pictographs are usually simple marks engraved or painted on walls and rocks, but a few instances involve quite complicated messages, listing, for example, the names of warriors by painting distinctive features: Red Crow, or Hunting Hawk. In nineteenth-century America, tribes such as the Cheyenne even sent pictographic letters to each other: a picture of a man in a canoe with a deer, followed by a picture of a man on foot pointing at a curved symbol and a man in snowshoes pointing at a sled meant, 'I'm crossing the lake to hunt deer, turning off before the next lake, and won't be back until spring.' However, messages which could be conveyed in this way were limited.

The Ashanti people of Africa decorate their houses with pictures recalling proverbs - a crocodile with a mudfish in its jaws can mean, 'If the mudfish gets anything, it will go to the crocodile in the end.' This 'sentence writing', however, only prompts the minds of those who have already learnt the proverbs, and so is not an effective means of general communication.

Knot Records
One of the most ancient methods of storing information is the knot record. Such records could be simple knots in a single strand, or complicated series of colour-coded knots on strings attached to higher-order strings. The Incas of ancient Peru used a knot record, the *quipu,* to achieve what writing achieved in similar contexts in other societies. They used several different types of knots to record their empire's trade transactions and the payment of taxes. Each knot held a specific decimal value (no knot in a certain place meant 'zero'). For example, one knot above two knots above a group of seven knots recorded the number '127'. Thus, there were specific cord places for the concepts 'hundreds', 'tens' and 'ones'. A special class of clerks who had been taught to read *quipu* oversaw and managed this highly complicated and efficient system.

Although not as complicated as those of the Inca, similar prehistoric *quipu* can be found from Alaska to Chile. They are the indigenous record-keeping system of the Pacific Rim. In a number of Pacific Islands, knots were tied in woven coconut fibre or material from other plants. Knot records are more versatile than other methods such as cutting notches in sticks or bones. Not only do they allow greater complexity, but they can also be easily 'erased' or 'rewritten' by untying and retying.

Notches

Slashes cut in soft stone, wood or bone also represent 'idea transmission'. Two pieces of elaborately notched ochre discovered in South Africa's famous Blombos Cave represent very early evidence of symbolic thinking, and other early artifacts such as the Ishango Bone from Zaire indicate similar markings made over a period of time. The marks on some of these artifacts seem to correspond with lunar cycles. Among more recent preliterate peoples, notches also served to record information: the genealogical boards of the pre-European Maori of New Zealand bore notches, each one representing the name of an ancestor. These were simple memory aids, which did not relate in any way to speech.

Other Mnemonics

Many further tools have aided memory and a few have even been related to spoken language. Probably dating from the early Stone Age, string figures or 'cat's cradles' - designs woven on the hand with a loop of string - have been known in almost all preliterate societies. They have been used to encode histories, songs, chants and more; they related to the spoken language, but could not pass information over time or distance.

Indexical symbols - five objects representing five sheep, for example - have been used by many cultures for thousands of years. The Yoruba people of Africa use pebbles as indexical symbols. To arrange a courtship, for example, a Yoruba man leaves six pebbles for a woman to find; in Yoruba, *efe* or 'six' also means 'attracted'. If the woman is interested, she leaves eight pebbles as an answer; the Yoruba word eyo, or 'eight' also means 'agreed'. However, these pebbles could not provide a durable record.

Conclusion

There is a great deal of controversy about the exact circumstances of the invention of complete writing. However, given the widespread nature of man's desire to record information, and the variety of these proto-writing systems, the invention of complete writing seems, in retrospect, to have been inevitable.

Questions 1 - 7

Classify the following as being mentioned in connection with

A *pictographic records*
B *knot records*
C *notch records*
D *other mnemonics*

Write the correct letter, ***A, B, C or D,*** *in boxes 1-7 on your answer sheet.*

1 an expression of romantic interest

2 a basic form of calendar

3 the writing of correspondence

4 music

5 images of aspects of nature

6 the recording of family relationships

7 a group of trained workers

Questions 8 - 13

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

In boxes 8-13 on your answer sheet, write

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

8 Native American pictography is now studied by experts from other disciplines.

9 Ashanti pictography can be easily understood by outsiders.

10 Incan *quipu* were used as a tool in buying and selling.

11 Incan *quipu* were more complex than knot records from other areas.

12 Yoruba pebbles were useful for messages that needed to be kept.

13 Experts disagree on when and how 'complete writing' began.

READING PASSAGE 2

*You should spend about 20 minutes on **Questions 14-26,** which are based on Reading Passage 2 on pages 5 and 6.*

Is it a farm or a forest?

Caroline Morrow Brown sees the future of farming through the trees

Szechuan pepper, an ingredient favoured by fashionable chefs, and hurling sticks, those essential adjuncts to the Irish national game, seem an unlikely cure for the ills of British agriculture. However, according to experts, these are the sorts of products farmers must consider if they are to survive.

They are just two examples of the many high-value items that can be produced by those bold enough to adopt a farming method known as 'agroforestry', where trees, livestock and crops are all raised on the same piece of land.

The environmental benefits of these ecologically rich systems are indisputable, not least because trees are efficient natural sponges that soak up greenhouse gases. But until recently their economic viability has been in doubt. However, the results of long-term trials by the British government and independent scientists around the country have exceeded expectations. Predictions that the shade cast by the trees would dramatically cut output have proved unfounded; indeed, in many cases, yields have substantially increased.

Trials in Northern Ireland, where sheep are grazed on pasture planted with avenues of ash trees, have proved particularly fruitful. Other experiments, such as raising poultry and growing vegetables in orchards, have doubled profits and reduced pest problems.

Jim McAdam, of the Northern Ireland Agricultural Service, says: 'Production levels decline slightly after 10 years, but this can be counteracted by pruning. There are distinct animal welfare benefits. The sheep seek out the shelter of the trees and they love eating ash leaves. In autumn, they clear the fields of leaves like animated vacuum cleaners.'

The timber, too, has turned out to be unexpectedly valuable. 'The price of ash for firewood is about £10 per tonne,' says McAdam. 'But you can increase that three-fold if you use it to make hurling sticks - as the players keep on smashing them, there is a big demand.'

Even without this novel add-on benefit, the trials have proved so successful that at least ten farmers in the region are trying the approach for themselves. McAdam says: 'Farmers are desperately looking for more flexible land-use methods and also for systems with environmental benefits, and agroforestry fits the bill.'

However, take-up in other parts of the country is much lower because, unlike Northern Ireland, grants to cover the relatively high set-up costs are unavailable.

Only a few visionary pioneers have had the means and the nerve to take the plunge. Bill Acroyd planted 11 acres of his 140-acre organic farm in Berkshire, England, with a mixture of wild cherry, walnut, oak and ash at a cost of about £10,000 in 1993. He grows barley and wheat between the timber, but intends to alternate crops with livestock now the trees are large enough. Acroyd, 66, says that he won't see a return on the timber from most of his 2,400 trees in his lifetime - cherries take about 50 years to mature, walnuts and oaks up to 200 - but for him the short-term return is not the point.

'Working on this part of the farm is by far the most pleasurable and fascinating. The important thing was to do something long-term to improve the environment and the landscape.'

Even if payback was not Acroyd's initial motivation, there have been unexpected benefits. 'People think agroforestry will reduce yields, but I strongly suspect mine have increased because the trees act as a windbreak. Also, we have had far fewer problems with insect pests.' In fact, his only worry is what might happen after he has gone. 'After all,' he says, 'Someone could come along and say, "That was a silly idea!" and cut them all down.'

Acroyd's fears are echoed by Martin Crawford, director of the Agroforestry Research Trust, who has conducted a campaign to promote agroforestry in the UK. He says that the lack of enthusiasm for these systems has more to do with attitudes than practicalities. 'Most farmers in this country hate trees. They don't think of them as food,' says Crawford. 'It's a long-term problem that farming and forestry are seen as separate, and change is desperately needed. New Zealand has been practising agroforestry successfully for 40 years, and it is a traditional way of farming in parts of eastern Europe. But suggest it here and they think you are talking from another planet.'

Crawford's frustration is understandable considering his achievement at the Agroforestry Research Trust, where he has developed a fine example of a forest garden, the branch of agroforestry most suited to the amateur enthusiast. Foods and wood products are grown in a multi-layered design that imitates the highly productive ecosystem of the woodland margin. Fruit and nut trees are underplanted with soft fruit and coppiced woods and the ground planted with vegetables and herbs. Managed in this way, a plot no bigger than a typical garden can sustain up to 90 productive species, not to mention a rich wildlife habitat.

The UK imports about 90 per cent of its timber, an unsatisfactory situation environmentally and economically. But according to Crawford, hardwoods such as the rot-resistant chestnut (soon to be in demand when arsenic-based preservatives are banned), black locust (similar to oak and the most widely used hardwood in the world), and alder (frequently used in furniture) could and should be produced at home.

Questions 14 - 22

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

In boxes 14-22 on your answer sheet, write

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

14 Agriculture in the UK is experiencing difficulties.

15 The economic benefits of agroforestry are still doubtful.

16 Shade from trees is a major disadvantage in agroforestry.

17 Production from crops grown in agroforestry is generally higher than was predicted.

18 Agroforestry has been taken up in. areas where animals need more food.

19 Agroforestry is used more in Northern Ireland than the rest of the UK because financial help is given to farmers.

20 Agroforestry is widespread in New Zealand because of the climate.

21 Agroforestry is unlikely to become popular in the UK in the immediate future.

22 Agroforestry is suitable only for large farms.

Questions 23 - 26

Look at the following statements (Questions 23-26) and the list of people below.

Match each statement with the correct person, ***A, B or C.***

Write the correct letter, ***A, B or C****, in boxes 23-26 on your answer sheet.*

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

23 In some areas the demand for certain products can boost the income from tree growing.

24 Certain types of trees ought to be grown in the UK.

25 Preserving the environment is more important than getting immediate profits from farming.

26 Agroforestry is the perfect answer to many farmers' problems.

List of People

A Jim McAdam
B Bill Acroyd
C Martin Crawford

READING PASSAGE 3

*You should spend about 20 minutes on **Questions 27-40,** which are based on Reading Passage 3 on pages 9 and 10.*

Marketing and the information age

A For the early practitioners of marketing in the late 19th and early 20th centuries, the business of selling was simply a matter of continually finding new customers. By contrast, marketing managers in the current era recognise the importance of gathering information about the market and about potential customers. They recognise that if companies are to be profitable, customers must gain and retain their perceptions of value from the brands they buy over a long time frame, rather than from a single transaction. This also means that customers must see value in returning continually to the stores where they shop, as well as to the service providers they deal with.

B Marketing practitioners and marketing scientists have never worked more closely than they currently do. There are many reasons for this, including the fact that this is the *information age* where convergence in telecommunications, media and technology is causing old ways to be challenged, and new methods and tools to be tested. Customer expectations have risen as new technologies allow new approaches. For instance, the subscriber-TV music channel Channel [V], encourages its viewers to sign up for text messages and email alerts that tell them when their favourite artists and songs are about to be broadcast. Competitive advantage lies in being able to recognise which customers can be given greater attention, not just because they demand it but because it makes commercial sense to provide high levels of product quality and service.

C Modem marketing information systems rely on information technology to enable marketing intelligence to be gathered and to store and analyse marketing research information. While some of the information used is gathered by government bodies such as the Australian Bureau of Statistics and Statistics New Zealand, most of it is purposefully gathered by marketing organisations for client companies. In the process, computer technology is used to manipulate the data and then to present the information in such a way that executives can readily identify any problems or issues, and quickly arrive at solutions.

D In order to produce superior value and satisfaction for customers, marketing managers need information at almost every turn. They need information about customers - end-users and resellers - as well as competitors and governmental and other forces in the marketplace. One marketing executive put it this way: 'To manage a business well is to manage its future; and to manage the future is to manage information.' Increasingly, marketers are viewing information not just as an input for making better decisions but also as an important strategic asset and marketing tool. As household incomes increase, choice widens and buyers become better at

discriminating, so sellers need information about how buyers respond to different products and advertising campaigns.

E The supply of information has also increased greatly. It has been suggested by the futurist and best-selling author John Naisbitt that the United States and, by observation, developed countries such as Australia, New Zealand and Singapore are moving from industrial to information-based economies. These post-industrial economies earn 70-80% of their Gross Domestic Product from services, and have entered what some commentators have termed the 'Information Age' or the 'Information Technology Era'.

F One study found that with all the information now available through supermarket scanners, a packaged goods product controller is bombarded with one million to one billion new numbers each week. As Naisbitt points out: 'Running out of information is not a problem, but drowning in it is.' Yet marketers frequently complain that they lack information of the right kind but have plenty of the wrong kind, or they claim that marketing information is so widely spread throughout the organisation that it takes great effort to locate even simple facts. In addition, subordinates may withhold information they believe will reflect badly on their performance and important information often arrives too late to be useful, or on-time information is not accurate. So marketing managers need better information. Although marketing organisations have greater capacity to provide managers with information, they often do not use it well. As a result, many marketing organisations are now studying their managers' information needs and designing information systems specifically to meet those needs.

G One solution is to use a Marketing Information System (MIS). This consists of people, equipment and procedures which, when put together, are able to gather, analyse, evaluate and distribute needed, timely and accurate information to marketing decision-makers. The MIS begins and ends with marketing managers. First, it interacts with these managers to assess the information needs they have. Next, it develops the needed information from internal records, marketing intelligence activities and the research process. The analysis unit processes the data to make it more useful and, finally, the MIS distributes it to managers in the right form and at the right time to help them make better marketing decisions.

H However, the costs of obtaining, processing, storing and delivering information can mount quickly. In some cases additional information will do little to change or improve a manager's decision, or the costs of the information will exceed the returns from the improved decision. For example, if an organisation estimates that launching a new product without any further information will yield a profit of $500,000, then it would be foolish to spend $30,000 for additional information that would increase the profit to only $525,000. By itself information is valueless - its value comes from its use.

Questions 27 - 31

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

Which paragraph contains the following information?

*Write the correct letter, **A-H,** in boxes 27-31 on your answer sheet.*

27 the fact that there may be too much information to cope with

28 the relevance of generating repeat business

29 an example of personalised marketing

30 an illustration of a situation where commissioning new information research might not be advisable

31 how the greater wealth of customers enables them to select from a broader range of products

Questions 32 - 36

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

In boxes 32-36 on your answer sheet, write

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

32 The majority of marketing statistics are gathered by government agencies.

33 The move from an industrial to an information-based economy has happened more quickly in New Zealand than in Australia.

34 Employees sometimes hide information that gives a poor impression of them.

35 Managers frequently fail to make good use of the information they receive.

36 Marketing information has to be used to be valuable.

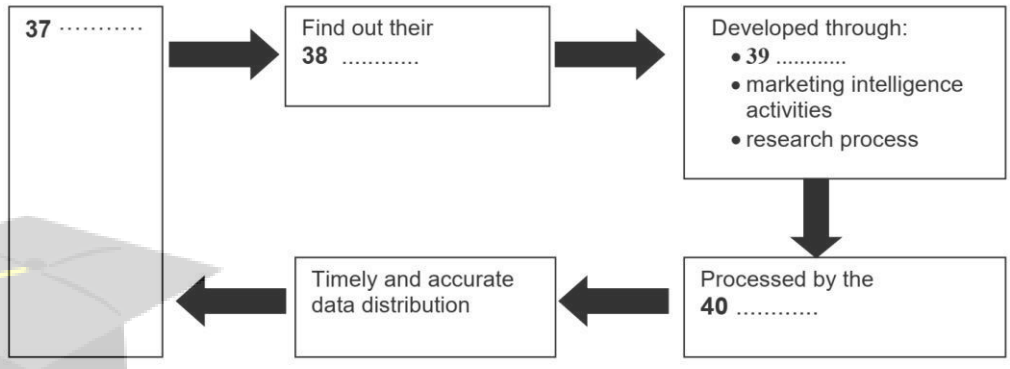
Questions 37– *40*

Complete the flow-chart below.

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

Write your answers in boxes 37-40 on your answer sheet.

The Marketing Information System (MIS)



Proto writing

Questions 1–7: Classification

1. **D**
2. **C**
3. **A**
4. **D**
5. **A**
6. **C**
7. **B**

Questions 8–13: True/False/Not Given

8. **TRUE**
9. **FALSE**
10. **TRUE**
11. **TRUE**
12. **FALSE**
13. **TRUE**

Is it a farm or a forest

Questions 14–22: True/False/Not Given

14. **TRUE**
15. **FALSE**
16. **FALSE**
17. **TRUE**
18. **TRUE**
19. **TRUE**
20. **TRUE**
21. **TRUE**
22. **FALSE**

Questions 23–26

23. **A (Jim McAdam)**
24. **C (Martin Crawford)**
25. **B (Bill Acroyd)**
26. **A (Jim McAdam)**

READING PASSAGE 2

*Answer **Questions 17-29**, which are based on Reading Passage 2 on pages 6 and 7.*

Sports Science

When the first Olympics took place in Greece 3,000 years ago, athletes could get by with little more than raw strength. These days, however, talent and guts just aren't enough to make it on the international circuit

A Olympic athletes today train with a dedicated team of sports scientists, each applying the latest research and technology to their quest for success. Everything from the fibres in their muscles to the cells in their brains is put through a rigorous workout programme to ensure that, on the big day, they walk out of their changing room with a perfectly designed body and a focused mind. It's not difficult to find examples of this, but what's behind this never-ending increase in performance? Most experts agree that part of it is down to huge advances in sports science, bringing not only a better understanding of the body and mind, but massive improvements in equipment design.

B Sports science can be split into four areas: biomechanics, physiology, psychology and technology. Biomechanics is the science that applies engineering principles to the motion of the body. Biomechanists analyse an athlete's movements using video, motion tracking, force transducers and instruments to measure electrical muscle activity and gauge internal and external forces on the body. 'We need to know which muscles are working when, and how hard, to understand technique and co-ordination,' says Dr Neil Fowler, a biomechanist at Manchester Metropolitan University and biomechanics chair for the British Association of Sport and Exercise Sciences.

C Over the years, Fowler has worked with his fair share of elite athletes, including Olympic javelin throwers and long jumpers, and has plenty of examples of when biomechanics has made a difference to performance. 'We found that in the long jump, it's best if the foot is moving backwards when it hits the board, like a kind of pawing movement. One of our elite jumpers made a radical jumping strategy change as a result of this advice and that season there was a substantial increase in their personal best.'

D But to get the best from biomechanics, an athlete has to be physically capable of making the changes – and that's where the physiology comes in. Physiologists often work closely with biomechanists to fill the physiological gaps that could make the difference between success and failure. What physiologists measure varies from sport to sport and even between events. For an endurance athlete, for example, a priority is to get enough oxygen to the muscles so they can work aerobically for as long as possible. Once your body reaches the maximum rate at which it can process oxygen, your muscles begin to work anaerobically and produce lactic acid, which leads to muscle fatigue. With this in mind, physiologists try to

Questions 17 – 19

Reading Passage 2 has eight paragraphs, A-H.

Which paragraph contains the following information?

*Write the correct letter, **A-H**, in boxes 17-19 on your answer sheet.*

17 a reference to a particular sports event which has benefited from close analysis of performance

18 a reference to the importance for athletes of recalling past successes

19 examples of devices used to gather data

Questions 20 – 24

Look at the following statements (Questions 20-24) and the list of people below.

*Match each statement with the correct person, **A-D**.*

*Write the correct letter, **A-D**, in boxes 20-24 on your answer sheet.*

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

20 He mentions the difficulty in satisfying conflicting demands.

21 He aims to prevent athletes from being deterred by unforeseen problems.

22 He describes an occasion when a small adjustment in technique led to improved performance.

23 He explains the need to observe athletes in action.

24 He mentions the importance of research in helping to decide upon the right amount of physical preparation.

List of People

A Dr Neil Fowler
B Dr Greg Whyte
C Dr Matt Carre
D Professor Ian Maynard

establish what is the maximum sustainable speed where lactic acid levels no longer rise.

E 'We know in general that if you want to get stronger, you lift a lot (bones become bigger and there's an increase in density leading to more strength); if you want to be a good endurance runner, you run a lot – but it's really about targeting each of these determinants of performance and training at the correct intensity, for the correct duration, at the correct frequency,' says Dr Greg Whyte, physiologist and sports science co-ordinator for the English Institute of Sport.

F But it does seem there is a limit to what the body can do, and in some parts there may now be little room for improvement. So this is where equipment can play an important role. The Sports Engineering Group at Sheffield University is just one group which is designing high-tech sporting equipment that can make changes. However, sometimes not everyone wants the same from technology. 'We get it from all angles,' says the group's Dr Matt Carre. 'Within industry, a company might want to make tennis rackets that can hit balls faster, but we also get governing bodies who want to know what's happening. Obviously they want new technology, but if it starts to spoil the game then they need to bring in some rule changes to stop that happening.'

G Even with a perfect body and the best equipment, the athlete's mind could let them down on the day. Professor Ian Maynard from Sheffield Hallam University is psychology advisor to the British Olympic Association, and works with the sailing and diving teams. As he explains, mental preparation can begin up to two months before the event, with competitors striving to maintain a positive frame of mind. 'The whole idea is that consistent preparation leads to consistent performance,' says Maynard. 'They might have videos, music, arrange to meet friends and family, anything that would be a positive distraction.' They are also trained to refocus quickly and put themselves back on track in case something goes wrong mid-event.

H Visualisation can add an extra dimension to training. 'Reliving your best performances is one of the best ways to build confidence, so we go through a performance in the mind's eye, reliving the emotions and the technical aspects of it,' says Maynard. Research also suggests visualisation is almost as good as practice. 'The neurophysiological explanation is that if you imagine a movement, you go through the same synaptic pathways in the brain as if you were actually executing it,' he says.

Questions 25 – 29

Label the diagram below.

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

Write your answers in boxes 25-29 on your answer sheet.

Nervous System
Imagining a movement involves the same pathways in the brain that are used to actually execute the movement, so the use of **25** ..... can be very effective in training.

Respiratory System
For endurance athletes there should be enough oxygen for the muscles to function **28** ..... for the maximum time. Any more than this will not be processed and will result in the production of **29** ..... and cause muscle fatigue.

Mind
As mental preparation, athletes are encouraged to participate in any activities which promote a **26** ..... .
Training is also given in how to **27** ..... if things don't go according to plan.

Skeletal System
Weight-bearing exercise can increase bone size and density, and therefore strength.

17: C

18: H

19: B

20: C

21: D

22: A

23: A

24: B

25: Visualization

26: Positive frame

27: Refocus

28: Aerobically

29: Lactic acid