Bài 1

You should spend about 20 minutes on Questions 1-12, which are based on Reading Passage 1 below.

INVASIVE SPECIES

Britain's rivers and estuaries are being invaded at an alarming rate by a small furry-clawed crab all the way from China. So how did a crab travel so far and why are naturalists so concerned? The mitten crab first arrived in Europe on ships sailing from Asia. It then spread rapidly from Portugal to Sweden and was first reported to be in the River Thames in 1935. From the Thames, it spread across the United Kingdom at a very rapid rate: by 1999 mitten crabs had spread across 448 km of British coastline, sometimes walking miles overland to reach the next river. A team from the University of Newcastle found that UK rivers are being invaded three times faster today than in 1935. And there's little wonder - a single female crab can carry between 250,000 and 1,000,000 eggs so mitten crab colonies expand very rapidly. Furthermore, cleaning up pollution from Britain's rivers is simply helping the invaders.

The mitten crab is one example of many invasive species that have found their way from their original habitat into foreign lands. There are several ways invasive species move from country to country: they may expand their territory naturally as their colony grows; but far more frequently an invasion is associated with human activity. The main causes include shipping, deliberate introduction for hunting or work, and the escape of pets into the wild. The introduction of the mitten crab to Europe was probably accidental: ships taking on water to use as ballast to keep the vessel steady on its journey from Asia to Europe also took on the unwanted guests and carried them to new areas to colonise. Elsewhere, invasive species have been purposefully introduced by man. In 1859, 24 rabbits

were introduced into Australia by Thomas Austin so that he could hunt them for recreation. Unfortunately, like the mitten crab, rabbits are prolific breeders: a single pair of rabbits are able to increase to 184 individual rabbits in just one and a half years and they spread at a rate of 130 km per year. Soon the population in Australia was out of control and had spread throughout the continent. Another domestic creature introduced from India into Australia in the 1800s was the dromedary camel. Camels were initially brought to work as pack animals to carry heavy loads across the hot desert interior of Australia. By 1920 it was estimated that around 20,000 camels were being used to transport goods. However, with the arrival of trains and cars, camels were released into the wild where their numbers had increased to around one million by 2008. Finally, the trade in animals as pets can enable a species to colonise areas far away from their native land.

Between 2000 and 2006 the U.S. Fish and Wildlife Service recorded 1.5 billion animal shipments made into America. 92% of these imported animals were then sold as pets, with the rest imported for research, education and zoos. While most of these animals were fish, the imports also included reptiles and mammals. When these pets escape and begin to breed, it can create serious problems. An example of this is in Florida, where in the 1990s a number of pet Burmese pythons — a snake native to south east Asia — escaped their outdoor enclosures when a major hurricane hit the state. Today, it is estimated that up 30,000 snakes inhabit the wetlands of the Florida Everglades. Burmese pythons, which can grow up to 20 feet long, are thriving on their new diet of native species, including endangered creatures, and are more than capable of competing with the American alligator for food.

The impact of invasive species is not to be underestimated. Katherine Smith, a conservation biologist at Brown University in Providence, Rhode Island states

that 'A huge amount of money goes into the myriad effects that invasive species have.' Smith continues, 'They destroy infrastructure. They cause public health threats. They harm livestock and native animals. They disrupt ecosystems. The dollar values really do increase quickly.'

When a non-native species finds its way into a new and vulnerable environment the damage can be more or less serious as the invader out-competes the local wildlife, brings in new disease or destroys the environment.

The Australian dromedary camel, forming the largest herd of wild camels in the world, competes for food with native species and may have aided the local extinction of preferred species such as the quandong tree. The Australian government estimate that the camel is responsible for AUS$10 million in damage to infrastructure and competition for livestock food every year. Even more damaging is the effect rabbits are having in Australia. Apart from the economic loss to the wool industry, estimated at AUS$95 million annually, rabbits compete with sheep for food. The animals have a devastating environmental impact. Close grazing of grass leads to soil erosion and has significantly altered the composition of extensive areas of land. While the real impact of the mitten crab in the UK is not known at present, scientists have noted that the crab is causing riverbank erosion as it burrows into the mud, forming a network of tunnels that make the riverbanks unstable. Invasive species are very difficult to manage once they have become established. Various methods have been tried to keep the populations under control. In Australia, 85,000 were culled and various methods have been tried to keep rabbit populations under control including poison and destruction of their warrens or homes. The latest idea in the UK to control the mitten crab is even simpler: catch them and give them to restaurants to sell as a tasty meal.

Question 1-3

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

TRUE *if the statement agrees with the information*

FALSE *if the statement contradicts the information*

NOT GIVEN *if there is no information on this*

1. Mitten crabs originated in Vietnam.
2. Crabs need water to spread.
3. Making rivers less dirty has aided the invasion of the mitten crab.

Questions 4-7

Look at the following items (Questions 4-7) and the list of reasons. Match each item with the reason for their introduction. Write the correct letter, ***A-E****, next to Questions 4-7.*

NB *There are three more reasons than you will need.*

Animal	Reason
4. mitten crab	**A.** was introduced as a predator species to protect plants from pests
5. rabbit	**B.** escaped while being used as a pet
6. dromedary camel	**C.** escaped from laboratories conducting experiments on animals
7. Burmese python	**D.** introduced by someone who enjoyed shooting
	E. came with water used to balance ships at sea
	F. were carried over by trains
	G. used to carry large loads across inhospitable areas

Questions 8-11

Complete the summary below.

*Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in spaces 8-11.*

The effects of the introduction of non-native species can bring them into **8.....** with native animals. Dromedary camels may have helped the **9.....** a native plant. Rabbits have led to the degradation of **10.....** across large areas of Australia. At the moment, the impact of the mitten crab is **11.....**

Question 12

Which of the following statements reflects the claims of the writer in the reading passage?

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

The writer of the article views invasive species as

A. a natural development.

B. a hard problem to manage.

C. a good business opportunity.

Bài 2

PRIVATE SPACE

A. It's a remarkable achievement: the question is no longer 'How can we send humans into space?' but 'How can we keep them there?' Spaceflight is reaching a turning point where new technologies in engine development, better understanding of aerodynamics and materials for body construction are making spaceflight possible for private industry.

B. The history of space exploration, until relatively recently, has been one of big government-backed projects like the Space Shuttle, Mars Landers and Long March rockets. But the most recent launches to the International Space Station (ISS) have been very special for at least three reasons. Firstly, along with 450 kg of scientific equipment, food and clothes, the rocket was carrying ice cream for the three space station astronauts. Secondly, the rocket was unmanned, being guided into docking position and back to earth again by remote control and automated systems. Finally, the rocket was commissioned from a private company by NASA.

C. When the privately owned rocket delivered its goods to the ISS, it marked a milestone in the evolution of space flight and vindicated NASA's decision to delegate routine supply flights to the space station. The flight has been a long time in development. It started with President George W Bush announcing his Vision for Space Exploration, calling for the ISS to be completed. Under the next President, America's Space Shuttles were retired leaving NASA with no

other choice but to look for alternative methods of supplying the ISS. The initiative was part of an effort to commercialise the space industry in order to decrease costs and spread the investment in the industry across a wider group than governments.

D. The initiative had many attractions for NASA. By outsourcing to the private sector the routine business of taking food and equipment to and from low-earth orbit, NASA can theoretically free up money to do things that it really wants to prioritise: missions such as sending astronauts to Mars and landing on asteroids by the 2030s. Now that the Space Exploration Technologies Corporation (SpaceX) has proved that private enterprise can be players in space exploration, firms are pouring money into developing new spacecraft built to transport cargo, to mine asteroids and to carry passengers into space.

E. In the last half of the twentieth century only government-backed agencies like NASA and Russia's ROSCOSMOS were capable of running space programs due to the gigantic investment costs and uncertain payoffs. However, SpaceX and similar companies are proving that the former conditions are no longer relevant as new solutions are coming to light. Commercial companies like Boeing are able to raise large sums of money to run these projects. Furthermore, as the firms are running cargo and taxi services to lower orbits, the break-even point is lower, the technology is cheaper and they have the benefit of years of experience in commercial aviation and space flight. Opening space programs to the commercial sector has the additional advantage of generating more solutions to old problems. An analogy is the invention of the Internet: when the technology went into the commercial sector, no one could

have envisioned the development of social network sites. Likewise, no one can predict where commercial enterprise will take the space industry.

F. The uncertainty surrounding where the space industry will end up is a problem as well as an asset and it is unsettling private investors who like to invest in relatively certain prospects. At the moment the industry is dominated by big-spending billionaires like the owner of SpaceX. In addition, the relatively small number of companies in the area could pose a problem in the future. The commercial space industry is still very new and there is no guarantee that progress will be smoother. For one thing, no one is sure that the business model is sound: government is still the major, if not only, customer available to the private space companies. The other problem is that space travel is high risk: the loss of space shuttles Challenger in 1986 and Columbia in 2003 illustrates that even the most carefully planned launches have unavoidable risks associated with them. The question is what would happen to the industry if another accident occurred. Finally, many space experts are doubtful that, even if private industry takes over the 'taxi' role for low-orbit missions, NASA will be able to achieve its ambitions, given its squeezed budgets and history of being used for political purposes. Furthermore, NASA may have created another space race, this time between government and private industry. If NASA doesn't go to Mars or the asteroid belt, its private competitors certainly have plans to do so.

G. In spite of all of these risks, many argue that it is critical for the private sector and federal government to work together to push further into space.

Question 13-18

Reading Passage 2 has seven paragraphs, A-G.

Which paragraphs, **A-F**, contain the following information?

*Write the correct letter, **A-F**, next to questions 13-18.*

13. NASA being able to spend money on important projects.
14. events leading to the commercialisation of spaceflight
15. new developments that have made spaceflight more accessible
16. an automated rocket that successfully completed a mission
17. the great dangers of space travel
18. new answers being found to previous questions

Question 19-25

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

19. Which is NOT mentioned as making private space flight possible?

A. new methods of constructing the rockets

B. modern substances from which to build the rockets

C. understanding better how air moves round objects

D. new methods of making space suits

20. Why are the recent launches special?

A. Their destination was the International Space Station.

B. They carried clothes.

C. They were not managed by a private company.

D. The rocket is not owned by a government.

21. In order to make NASA look for other spaceflight providers, the US government

A. invested in private space companies.

B. started to build the international space station.

C. stopped using the Space Shuttle.

D. allowed private companies to fly into space.

22. Private companies

A. need to reduce the cost of space projects.

B. have social network sites.

C. are able to fly rockets at high orbits.

D. act as ferries to and from the space station.

23. At present, the private space industry is characterised by

A. uncertainty about how to make profits.

B. companies controlled by individuals.

C. companies too small to raise the amount of money needed.

D. government interference.

Questions 24-29

*Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the passage for each answer. Write your answers in spaces 24-29.*

There are a number of problems with commercial space projects. To start with, the **24**..... might not be sound. There is also great **25**..... attached to space flight - what would happen if there was another **26**.....? Experts doubt whether NASA can fulfil its **27**..... as it has offer been under **28**..... pressure. Moreover, the development may lead to a **29.**..... between NASA and the private space industry.

Bài 3

Questions 30-34

Reading Passage 3 has six paragraphs, A-F.

*Choose the correct heading for paragraphs **B-F** from the list below.*

Write the correct number, i-ix, next to questions 30-34.

List of Headings

i. Shielding the earth from the atmosphere

ii. Bouncing back the sun's rays from earth

iii. The effect of volcanoes on the atmosphere

iv. Criticisms of geoengineering

v. Trapping greenhouse gases

vi. The root of the problem

vii. Why attempt geoengineering?

viii. Protecting glaciers

ix. The need for action

30. Paragraph B

31. Paragraph C

32. Paragraph D

33. Paragraph E

34. Paragraph F

ENGINEERING A SOLUTION TO CLIMATE CHANGE

A. Looking at the rate of climate change and the disastrous effects it is having on the world, scientists are concerned that we are acting too slowly. Many are now looking to geoengineering — large-scale human interventions to change the world's climate — to counteract global warming. The schemes range from the mundane to science fiction but all come from the same impulse: if we don't do something now, it may be too late to do anything.

B. Climate change is now so rapid that, in the very near future, the Arctic will be ice-free during winter as less ice forms during winters and more melts in summer. Scientists say that tackling climate change isn't a problem we need to deal with in 10 or 20 years' time; we need to look at radical solutions now. A study has shown that the technologies to produce these geoengineering projects already exists and could be in place for around $5 billion a year. This is a bargain when compared with the cost of reducing carbon dioxide emissions, a major greenhouse gas: that figure stands at somewhere between $200 and $2,000 billion.

C. So what exactly are scientists planning to do to deal with global warming in the short term? Among the main schemes are shielding the earth from the sun's rays either at ground or atmospheric level, or capturing the carbon produced by industry and sinking it back into the ground or the sea. Shielding the world has produced ideas that range from simple science to science fiction. One suggestion has been to make the roofs of buildings and roads whiter to reflect the sun's rays back into space. While this has the advantage of simplicity, it simply won't make much difference, reflecting only 0.15 watts per square metre, averaged across the planet. To put this into perspective, to stop earth warming we need to increase heat loss by about 3.7 watts per square metre averaged

over the world. Another idea is to protect the Greenland ice field by covering it in giant sheets of reflective material. If this works, it could help in the Antartic where the giant Filchner-Ronne ice shelf is melting rapidly. If this glacier disappears completely, it would raise sea levels, causing catastrophic flood damage around the planet.

D. If reflecting heat back from the ground has little effect, there are two alternatives: seeding clouds and replicating volcanic activity. The first idea is to make clouds whiter by increasing the amount of rain in them. Sending salt particles into clouds should 'seed' the clouds with more raindrops. Clouds carrying more raindrops would be whiter and better reflectors of sunlight. This could be good news for the earth and in addition could be stopped when necessary with the salt completely clear from the skies within ten years. Unfortunately, other research indicates that creating whiter clouds may have unwanted side effects, producing adverse weather conditions in the region and changing ocean currents. A much older idea is to replicate the effect volcanoes have had on the atmosphere. A volcanic eruption sends large amounts of ash and sulphur into the air, which block the sun and create cooler conditions. For example, when Mount Pinatubo erupted in 1991, it produced a sulphur dioxide cloud, which reduced average global temperatures by one degree centigrade. Geoengineers have long put forward the idea of circulating particles of sulphur in the atmosphere to counteract global warming. The particles would be delivered by aircraft or balloons spraying them into the atmosphere. However, this also has unpredictable effects on the amount and pattern of rainfall. Furthermore, this method would delay the recovery of the ozone layer over the Antartic by 30 to 70 years. More ambitious geoengineering projects have included placing billions of reflective balloons between the sun and the earth and putting giant mirrors into orbit. Scientists have criticised these approaches

as 'science fiction' and say they are unlikely to happen due to the huge costs involved.

E. Whatever actions we take to block or reflect the heat from the sun, we will still need to reduce the amount of carbon dioxide in the atmosphere. Various geoengineering projects have been proposed to do this. Carbon capture technologies range from planting trees, which naturally use carbon dioxide as they grow, to pumping carbon back into the earth and trapping it there. This is a good idea but would only account for about 0.5 watts per square metre. Carbon capture technologies are already in use at power stations where the greenhouse gas is taken at point of production and pumped underground into depleted gas and oil reserves. However, the technology to do this is not very efficient. Other ideas for taking carbon out of the atmosphere include seeding the oceans with iron. This would increase the growth of plankton which, like trees, use carbon naturally. Unfortunately, this would only account for 0.2 watts per square metre.

F. Proponents of geoengineering have never regarded the earth-changing engineering projects as a complete solution. Nevertheless, the concept as a whole attracts many criticisms. One is that the problem of climate change is of such huge scale and complexity that there will not be one single solution. All proposals so far have advantages and disadvantages. The biggest problem of all is that many of the projects are untested and any of the proposals may have unforeseen consequences. For example, we could not suddenly stop a geoengineering scheme: keeping temperatures artificially low for a period then taking away the cause of this would cause the temperature to rise again rapidly. Furthermore, global engineering solutions to the problem of climate change would need the agreement of all the world's leaders: having an American solution, a Chinese solution, a Brazilian solution, and so on simply wouldn't be

politically acceptable. But the biggest downfall is that geoengineering projects could reduce the political and popular pressure for reducing carbon emissions, as politicians point to geoengineering for an answer rather than tackling the real cause of climate change: human activity.

Questions 35-40

Classify the following as typical of

A. land-based reflection
B. atmospheric reflection
C. carbon capture

*Write the correct letter, **A**, **B** or **C**, next to Questions 35-40.*

35. removes carbon dioxide as soon as it is produced

36. increases the reflectivity of white clouds

37. cleans carbon dioxide from the air naturally

38. would increase the number of small plants and animals in the sea

39. may help prevent rising water levels

40. is similar to the effect volcanoes have on the atmosphere

Bài 4

Questions 1-5

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

Choose the correct heading for paragraphs A-D and F from the list of headings below.

Write the correct number, i-ix, next to Questions 1-5.

List of Headings

i. Improvements to faba bean farming

ii. Increasing productivity to secure the future of legume farming

iii. The importance of legumes

iv. The nutritional value of legumes

v. The effect of farming on the environment

vi. Legumes in the diet of ancient peoples

vii. The importance of reducing meat consumption

viii. Archaeological discoveries

ix. Legumes as a provider of protein

1. Paragraph A

2. Paragraph B

3. Paragraph C

4. Paragraph D

5. Paragraph F

A. The health benefit of legumes has been widely known for centuries. Also known as pulses or, more commonly, beans, they belong to an extremely large category of vegetables containing over 13,000 species. Only grain supplies more calories and proteins to the world's population. Today, agricultural researchers and scientists are experimenting with varieties of legumes that are easier to harvest, more resistant to disease and yield better crops.

B. Beans are often refers to as “the poor person’s meat”, but this label is unfair – considering the health benefits of legumes, they should really be called ‘the healthy alternative of meat’. Beans contain a rich and varied supply of nutritional substances, which are vital for keeping in good health. Diets rich in beans are used to help with a variety of health issues including lowering cholesterol levels, improving blood sugar control in diabetics, reducing the risk of many cancers, lowering the risk of heart diseases and lowering blood pressure. Beans are a good source of protein but are often considered to be an 'incomplete' protein as they lack the essential amino acids that we need to complete our diet. Foods from animals (meat, fish, eggs, dairy products), on the other hand, contains protein and amino acids. However, many cultures combine beans with grains to form a complete protein that is a high-quality substitute for meat – rice and soy in Japan, corn and beans in Mexico, rice and lentils in the Middle East. Beans are also a good source of fibre, giving the consumer between 5 and 8.6 grams of fibre per 100 grams eaten. Fibre is an important ingredient in a healthy diet with great benefits to our digestive system and in reducing cholesterol levels, which in turn reduces our risk of heart disease. Fibre also helps us to feel full and control our appetite.

C. Why is it important to substitute meat as much as possible? First of all because of the health implications – red meat in particular has a high fat content. Secondly, antibiotics and other chemicals are used in the raising poultry and cattle. Thirdly, the cost to the environment is much greater in raising cattle than it is in growing crops. To produce a kilogram of beef, farmers need to feed the cow 15 kilograms of grains and a further 30 kilograms of forage.

D. Little wonder then that legumes have been used from ancient times. According to Trevor Brice in *Life and Society in the Hittite World*, the Hittites, an ancient people living in Anatolia from the eighteenth century BC, ate a wide variety of legumes including peas, beans, faba beans, chickpeas and lentils. And in ancient Egypt, Ramses II is known to have offered 11,998 jars of beans to the god of the Nile. Archaeologists have found the remains of legume on land beneath the Lake Assad in Syria dating back to 8,000 BC and, astonishingly, a 4,000-year-old lentil seed found during an excavation in Turkey has been germinated, allowing scientists to compare the ancient variety with the organic and genetically engineered varieties of today. Professor Nejat Bilgen from Dumlupinar University, who led the archaeological team, said that the lentils were found in a container dating from the Bronze age. The plant grown from the ancient lentil was found to be 'pretty weak' in comparison with modern varieties.

E. Modern agricultural research has tended to focus on grain production, breeding new varieties of wheat and other crops rather than improving the varieties of legumes, which can suffer from low yields and unstable harvests. For this reason, farmers started to abandon them in favour of more dependable crops, which had had the benefits of scientific improvement. Recently, scientists

have returned to legumes to identify desirable characteristics such as height, good crop production and resistance to pests in order to cross different plants with each other and produce a new, improved variety. Using traditional breeding methods agricultural scientists are transforming the faba bean into a variety that is easier to grow. Traditional varieties are undependable as they rely on insects to pollinate them. But faba bean types that can self-fertilise naturally were discovered and the gene is being bred into new varieties. Other faba bean varieties have been found that produce higher yields or shorter crops. Faba bean plants tend to grow tall and fall over in the field making them difficult to harvest mechanically so breeding plants that are 50% shorter means they are more stable. Unlike the traditional plants, the new faba bean plants end in a flower – this means that more of the plant's energy is transformed into producing beans instead of unusable foliage.

F. With the new varieties, farmers in some regions are achieving a marked rise in production – between 10% to 20% improvement. Scientists have also managed to develop a commercial faba bean able to resist the parasitic weed Orobanche, which has been known to destroy whole fields of the crop. The future of legumes and the farmers who grow them is becoming brighter. Legumes are an important source of nourishment for humans and also for the soil: the beans take nitrogen directly from the atmosphere and fix it into the soil to provide nutrients for other crops and save the farmer the cost of artificial fertiliser. Making legumes a profitable crop for the future may prove an essential factor in feeding growing populations.

Question 6-11

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

TRUE *if the statement agrees with the information*

FALSE *if the statement contradicts the information*

NOT GIVEN *if there is no information on this*

6. Legumes are second to grain in providing people with calories and protein.

7. Beans can help to cure heart disease.

8. Antibiotics are used when farming animals for food.

9. Scientists have the opportunity to see how similar modern and ancient lentil plants are.

10. Agricultural scientists are making the faba bean easier to grow in dry areas.

11. New varieties of faba bean can destroy parasitic weeds.

Question 12

What is the best title for Reading Passage 1?

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

A. The health benefits of beans and pulses

B. Diet in ancient times

C. Agricultural scientists give legumes a new lease of life

Bài 5

WHAT IS DYSCALCULIA?

When you look at the morning newspaper or check a news webpage, numbers are everywhere: the date is 12th September; it's 16°C in London; England lose 2-1 at football; the time is 12.30. But for people with dyscalculia, dealing with numbers presents a particular everyday difficulty. Dyscalculia is a learning difficulty in mathematics. It was originally uncovered by Kosc - a Czech researcher - after research into damage to parts of the brain involved in mathematical cognition. Dyscalculia can have two causes: brain damage or 'acquired dyscalculia' and developmental dyscalculia - or dyscalculia from birth. Whichever the cause, dyscalculia has three features: problems with mathematics; problems with mathematics only, not other areas of learning; and the assumption that these problems are rooted in brain activity. Unlike dyslexia - difficulties with words - dyscalculia has been relatively little studied until recently. Very little is known about its causes, prevalence or how to treat it. Estimates indicate that between 3% and 6% of the population could be affected. The figures refer to children who only have difficulties with maths but have good or excellent performance in other areas of learning. People with dyscalculia have difficulty with the most basic aspects of numbers and mathematics, but this does not mean that the person affected has difficulty with higher mathematical reasoning or arithmetic. In fact, the evidence from brain-damaged dyscalculic people shows that an individual might suffer dyscalculia but can even show great ability in abstract mathematical reasoning. Dyscalculia appears to be related to an ability shared between humans and many other animals. This is called 'subitizing' and is the capacity to count the

number of objects by briefly looking at them. Subitizing seems to be an innate skill present in humans from birth and is a useful survival skill for humans and animals: there is a big advantage in being able to count how many predators or prey there are. Experiments with babies show that we are able to count at a very early age: if a baby sees a doll put behind a screen then another doll is also put behind the screen, the baby expects to see two dolls when the screen is removed. Babies will look longer at things they didn't expect to see, so if the screen is removed and the baby sees only one doll or three dolls, they stare at this unexpected sight longer, proving our ability to count from infancy. Dyscalculia could be explained by the lack of this innate capability. Genetic causes could include known genetic disorders such as Fragile X syndrome. However, as well as genetic factors, there could also be environmental causes such as drinking alcohol during pregnancy, which can result in underdevelopment of the brain.

There are many signs of dyscalculia including some well established and some less well researched. There are a number of symptoms that we are relatively certain of. Firstly, counting: whilst discalculic children can learn the sequence of numbers — 1, 2, 3, 4, 5, etc,— they have difficulty counting backwards or forwards, particularly in twos or threes. Secondly, they find learning and remembering number facts difficult and often lack confidence even when they have the right answer. They can't use rules correctly either; for instance they may know that 4+2=6 but not be able to see that 2 + 4 = 6 or understand the concept of addition. Thirdly, they have problems with numbers with zeros and don't understand that the numerals 10, 100 and 1,000 are the same as the words ten, one hundred and one thousand. Fourthly, dyscalculic children may not be good at using money or telling the time. Concepts of speed or

temperature may be difficult for them to fully understand. Finally, they may have problems in understanding directions or in following a map.

Diagnosing and treating dyscalculia is not straightforward as there are many reasons for being bad at maths including poor teaching, lack of motivation and inability to concentrate for long periods of time. An important result of present research will be to improve our methods for identifying children with dyscalculia. The treatment of the problem, however, is a different matter. Many people think that, because the cause of dyscalculia is in the brain, it can't be treated. But this is a misunderstanding. Every time we learn a new fact or skill, our brain changes. Furthermore, if we practise a new skill extensively the brain changes considerably. This is related to a property of the brain called 'plasticity', which simply means the ability of the brain to develop and change, particularly during childhood. Dyscalculia could be treated by experiences at home, providing an environment that encourages children to count. Schools could pay more attention to making sure children understand basic mathematical concepts before dealing with more advanced ideas; they should, for example, avoid teaching the division of fractions before ensuring children have understood to concept of division. Teaching maths through a multi-sensory approach using speech, sound, writing and reading simultaneously has been shown to be a good approach. Finally, maths should be taught in short blocks of time and lessons should build on what was taught previously.

Questions 13-16

Complete the sentences below.

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

13. A person with dyscalculia cannot solve basic..... problems.

14. The condition was first discovered by a researcher investigating..... to the brain.

15. Dyscalculia can be caused by injury to the brain or it can be present.....

16. Other aspects of..... are not affected by dyscalculia.

Questions 17-22

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

17. There is not much information on how many people have dyscalculia.

18. People with dyscalculia are not able to do advanced maths.

19. *Subsitizing* means knowing how many things there are by counting them.

20. Experiments show that babies are able to count to four.

21. One explanation is that people with dyscalculia have not inherited a common ability.

22. Drinking alcohol may be linked to the development of dyscalculia.

Questions 23-29

Classify the following as typical of

A. *reasons for being bad at maths*
B. *plasticity*
C. *dyscalculia*
D. *the treatment of dyscalculia*

*Write the correct letter, **A**, **B**, **C** or **D**, next to Questions 23-29.*

23. limiting maths teaching to short periods
24. being unmotivated to learn
25. the brain developing, especially when young
26. not associating words about figures with numbers
27. needing practice at telling the time
28. using all the senses when doing maths
29. poor concentration for longer lengths of time

Bài 6

CROWDMAPPING

One of the most exciting mass movements today is crowdmapping: sharing data collectively to produce a visualisation on a map giving almost-instant information on current events. Crowdmapping produces a picture of events on the ground as they happen by taking text messages and social media feeds together with geographic data to distribute real-time, interactive information on events such as revolutions, wars, humanitarian crises and natural disasters. This new application of social networking can bring fresh insights into events, which can be nearly impossible to cover through traditional methods of journalism where individuals report into a central newsroom. It has the additional advantage of mapping longer-term trends that fall in and out of the news.

Technologies like mobile phones and the world wide web have made it possible for those people caught up in a war or natural disaster to broadcast information from the affected area and for this information to be collected in a way that emergency aid services can use and act on. In a disaster situation the most current information is essential because the needs of, for example, flood victims change minute by minute. It enables response organisations to get an understanding of a crisis situation quickly (thus it is sometimes called *crisis mapping*), give targeted aid to people most in need and form a network of reliable reporters on the ground to check information going to the live updated map. When an emergency situation arises, a small army of volunteers comes together to collect incoming information and put it on the map. Some of the information conies from official sources such as the United Nations, but the most powerful aspect of data collection is the ability to pull information from

Twitter posts, emails and text messages. Once this information is available, volunteers collaborate via the Internet to put data on to a map, which is updated every second to build a comprehensive picture of the scale and severity of the disaster. Volunteers from all over the world translate the messages coming in from the disaster zone into English and plot the information on the live interactive map.

One of the originators of crowdmapping is Ushahidi. The developers of crowdmapping software began the project in Kenya to map reports of violence after a controversial election result in 2008. Later, in 2010 in Haiti, a similar approach of collectively sharing information to help emergency services deal with the situation was adopted. A small team released a free phone number - 4636 - to allow victims of the 7.0-magnitude earthquake to text their requests for medical aid, water and shelter. Over 1,000 workers and volunteers around the globe, contacted via Facebook, translated the messages, mostly in Haitian Creole. They then prioritised and geolocated the requests for help via crowdmapping software. Through this service, emergency response teams were able to save the lives of hundreds of people and send food, water and medicine to tens of thousands. The success of Project 4636 led to the development of crowdmapping when dealing with critical and even non-critical situations.

Most recently, crowdmapping has been used to track violent activity in warzones and areas with uprisings. In one country, when the people rose up against their leader, the United Nations monitored the escalating violence via a crowdmap to provide them with information on what was happening in the country. In another country, rebel fighters reported people who were missing, killed or arrested according to eyewitnesses. Other uses for the software have included the Danish people's attempt to map the extent of CCTV surveillance in their country. Since the project began, 2,220 CCTV cameras have been

photographed and verified by journalists. However, not all attempts at crowdmapping have been successful. The attempt to map an uprising in one country was cut short when the authorities took the country offline and, when the Internet was brought back, the crowdmap had been forgotten.

There are other downsides to crowdmapping. According to George Chamales, there are security challenges: it must be ensured that the system stays operational and that the information collated is not misused. Firstly, the lead crowdrnap tends to be the one that is set up first and has the most users. Unfortunately, the organisation behind the first crowdrnap may not be the best one to manage the complex process of collecting and managing the data. Secondly, there are several platforms for producing crowdmaps including commercial products and open-source projects like Ushahidi. Some have even been developed for a particular crisis such as the nuclear meltdown in Fukushima — all of these have their own disadvantages: commercial software may need to patch bugs in the programme; open source software may overlook security in favour of functionality. The information collected needs to come from trustworthy sources, which are then relied on for more reports; this may make the person sending the report a potential target in war situations. Finally, there is the human element in processing the information, relying on thousands of volunteers to translate, categorise and prioritise the information. There is an obvious risk in giving strangers access to messages generated in dangerous circumstances: messages may be deleted and the sender's identity may be compromised.

While the introduction of any new technology has flaws, George Chamales believes that crowdmapping cannot afford to go through the same maturation as other technologies: the risks to people using it in hostile political situations are too great and could lead to them being arrested or killed. Furthermore, over time the technology may be labelled as dangerous, leading organisations to

shun an extremely useful instrument. The answer, Chamales believes, can be found in developing standards through collaboration between IT security experts and the crowdmapping movement. New challenges and issues will arise with each crisis mapped by the people affected, but George Chamales thinks that establishing security standards would be a good starting point to allow this valuable new form of networking to evolve.

Questions 30-34

Label the diagram below using words from the box.

Write the correct letter, A-E, in spaces 30-34.

Crowdmapping actions

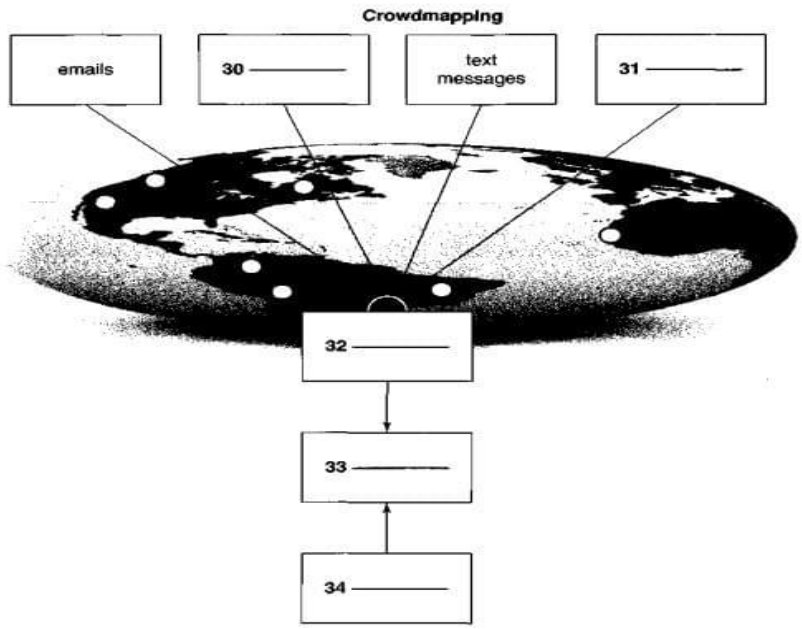
A. interactive map

B. social media feeds

C. emergency services

D. volunteers collect and translate

E. official sources



Questions 35-40

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

35. Crowdmapping aims to produce data on

A. historical and future patterns of behaviour.

B. political events.

C. interactive maps.

D. events after earthquakes only.

36. Crowdmapping allows emergency services to

A. contact journalists.

B. help everyone who needs it.

C. check information online.

D. act quickly in specific areas.

37. The operation relies heavily on

A. a project in Kenya.

B. a small team

C. people translating messages.

D. emergency response teams.

38. The fourth paragraph contains examples of crowdmapping in

A. countries with no internet access.

B. natural disasters.

C. areas of conflict.

D. a country with a lot of traffic cameras.

39. Which is NOT a disadvantage of crowdmapping?

A. the inability of some organisations to handle the data effectively

B. unreliable information

C. security being compromised

D. computer crashes

40. What is the best way to deal with the problems associated with this new technology?

A. wait for problems to be resolved

B. arrest people using it incorrectly

C. agree common practices to make crowdmapping secure

D. change the process when new problems arise

Bài 7

SEAS BENEATH THE SANDS

A. Look at a map of North Africa from Egypt to Algeria. Almost everything outside the Nile Valley and south of the coastal plain appears to be lifeless sand and gravel deserts. But peer deeper, under the sand, and you will find water. Under the Sahara lie three major aquifers, strata of saturated sandstones and limestones that hold water in their pores like a wet sponge, The easternmost of these, extending over two million square kilometres, contains 375,000 cubic kilometres of water—the equivalent of 3,750 years of Nile river flow. It is called the Nubian Sandstone Aquifer System, and lately it has come to the attention of practitioners of a subspeciality of nuclear science known as isotope hydrology.

B. Isotope hydrology, which studies the atoms of the two elements making up groundwater—oxygen and hydrogen—and the trace elements in it, like carbon and nitrogen, is able to determine when, give or take a couple of thousand years, today's groundwater fell to earth as rain. In the case of the Nubian Aquifer, some water in the system is thought to be one million years old, but most of it fell between 50,000 and 20,000 years ago. Since then, as the region has slowly turned to desert, there has been little addition of water to the aquifer. What lies beneath the ground is called fossil water, and it will likely never be recharged.

C. Because the Nubian Aquifer is shared among four nations, and because Libya and Egypt are now going forward with big water-pumping projects that

tap the Nubian Aquifer, the International Atomic Energy Agency (IAEA), co-recipient of the 2005 Nobel Peace Prize, is trying to bring the countries together in a joint effort to plan for a rational shared use of the water.

D. The stakes are certainly high. Egypt eventually hopes to use almost half a billion cubic metres of groundwater annually—more than the volume of Lake Erie. Libya is already pumping water from the Kufra Oasis, in its southeast corner, through a four-metre-diameter pipeline to its thirsty coastal cities. When fully operational, that project will pump some 3.6 million cubic metres per day. Still, at current extraction rates, the aquifer is not likely to be depleted for a thousand years.

E. Dr Taher Muhammad Hassan of the EAEA (Egyptian Atomic Energy Authority) says One thing that isotope studies have shown us is that there is surprisingly little aquifer recharge from the Nile. Nile water has a younger isotopic profile, and samples from wells dug as close as five kilometres from the river show no sign of the Nile fingerprint. In fact, some of that well water is dated at 26,000 years old." Hassan is confident there is little likelihood of international conflict over aquifer sharing. "We know that the velocity of underground flow in most places is just two metres a day," he says. "It's like sucking a thick milkshake through a straw—it doesn't happen fast, and eventually it stops completely." Even Libya's big extraction plans for Kufra will probably have only a minor effect on Egypt's East Uweinat farming area, given the distance between the two. If Kufra's water table drops 200 metres, the Egyptian side might see a drop of only 10 centimetres.

F. At al-Agouza West in Egypt, a 10-story drilling rig, the same kind used to drill oil wells, has reached 800 metres and is now evacuating the drilling mud and widening the bore. It has taken 20 days to penetrate layers of shale and clay to reach the saturated sandstone—the basement of the Nubian formation is some

1,800 metres deep here—at a cost of about $400,000. Once the well is ready for testing, the ministry engineers check its static and dynamic levels with a sounder, a kind of fisherman's bob at the end of a tape measure that rises and falls with the water table.

G. Dr Khaled Abu Zeid, of the Egyptian non-profit Center for Environment and Development of the Arab Region and Europe (CEDARE), stresses the social context of water-resource development, and the need to keep in mind traditional water users as well as new users. Small farmers and Bedouin who rely on shallow wells should not be ignored in favour of the big development schemes. "They need water today," he says, "and will still need it tomorrow. We must not let it run dry because deeper wells are more cost-effective. But neither should we have an absolutist conservationist approach, in which we try to keep fossil water in some kind of 'museum' for their benefit."

H. The director of the Groundwater Research Institute at the Nile Barrage, Dr Ahmed Khater, finds it ironic that in a desert region like the Middle East, petroleum geology is much better understood than subsurface hydrology. "But water is what makes our life possible here, and we must use it wisely,' he says. He cites the experience of President Nasser's "New Valley" project in the 1960s, which proposed a massive resettlement of Nile Valley farmers to the western oases. It was a failure. "These isotope studies hold the promise of learning more about what is really our most precious asset—water, not oil," he says. Nasser, he notes, got the New Valley project's motto wrong. "He said, 'When settlers come, then we will find water.' He should have said, 'When we find water, then settlers can come."

Questions 1-4

Complete the table below.

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

Nubian Sandstone Aquifer system
Extent: **1.....** 375,000 km^3 of water
Formation: The majority of the **2.....** between 50,000 and 20.000 years ago.
Flow: water moves only **3.....** a day in most places
Depth: The **4.....** of the formation is 1,800 metres deep.

Questions 5-12

Reading Passage 1 has eight paragraphs, ***A-H***.

Which paragraph contains the following information?

*Write the correct letter, **A-H**, next to Questions 5-12.*

5. dating the age of the water

6. understanding underground water through studying isotopes

7. the process of water collection

8. review of the likelihood of conflict

9. the importance of water for North-Saharan countries

10. Layers of porous rock holding water under the desert

11. attention to the needs of local people

12. cross-country project for the use of water

Bài 8

HIGH INTENSITY TRAINING

Endurance vs intensity

The traditional view of exercise is that more is better. But now a new form of exercise is challenging the old view and causing debate between traditionalists and proponents of a new form of exercise, High Intensity Training (HIT). Current recommendations from the US Department of Health and Human Services say adults aged between 16 and 64 should take two kinds of exercise every week: aerobic and muscle-strengthening. Aerobic exercise covers activities that make you breathe harder and your heart beat faster - activities such as walking quickly, swimming or playing a relaxed game of tennis. Muscle-strengthening exercises work all the major muscle groups in a person's body - legs, hips, back, chest, abdomen, shoulders and arms. The US Department of Health and Human Services recommends that adults do two hours and thirty minutes of moderate-intensity aerobic activity per week and muscle-strengthening activities on at least two days per week. A lot of people, perhaps understandably, never meet these targets, usually citing lack of time as the main reason. However, a recent study has removed the old excuse. Professor Martin Gibala, from Canada's McMaster University, has published research in the Journal of Physiology that shows doing less exercise can be more effective than time-consuming periods of aerobic and muscle-strengthening activities. High Intensity Training is very simple: it involves a warm-up period followed by a short burst of intense activity, usually 30 seconds to one minute, then a recovery period where you exercise at a gentler pace for a couple of minutes, then another short period of high-energy activity. After a second recovery

phase, there is more energy-intensive exercise before slowing down for a while, then stopping. That's all your exercise for the day. This cycle of warm up / intense activity / recovery / intense activity, etc can be applied to a variety of sports such as cycling, jogging and swimming.

How does it work?

There are a number of different explanations as to why HIT seems to be more effective than endurance exercise. Firstly, exercising at low intensity only burns calories while you are active so that the minute you stop, you also stop burning calories. In contrast, high-intensity exercise continues to work on your metabolism a long time after you have finished - and this can be up to 24 hours later - so that you continue burning calories for longer. Secondly, HIT builds your muscles, replacing fat with muscle mass. The third theory is that the sprint-and-recover cycle doesn't give the body the chance to store energy in the same way as training over a long period: the body needs to use all the energy in one go rather than maintain the same energy level over a longer period and still being able to reserve some as fat. The final theory is HIT combines both aerobic and muscle-strengthening activities and uses many more muscles than regular exercise - up to 80% of the muscles in the body, compared with up to 40% for moderate jogging or cycling.

There have been numerous experiments into HIT. In one conducted by a team from the University of Colorado led by Kyle Sevits, five male volunteers were tested to measure the number of calories a typical HIT workout bums. The volunteers, aged between 25 and 31, were tested to make sure their hearts were healthy, and their body composition and resting metabolic rates were measured. The participants ate a specific diet, then taken to a hospital room

where researchers were able to control the air intake and determine the oxygen, carbon dioxide and water content of the air. Through these indices researchers were able to measure how many calories the volunteers burned. While each person lived in the room, they were kept on their strict diet and could only watch TV or use a computer. However, on one day they were asked to participate in HIT on a gym bike, pedalling as fast as they could for five 30-second periods with four-minute recovery periods between. The results were startling: the volunteers burned an average of an extra 200 calories on the workout day in spite of doing high-intensity activity for just 2.5 minutes. Other experiments have revealed similar results. In Japan, a team from the National Institute of Fitness and Sport separated individuals into two groups. The first group trained five days a week over six weeks, taking an hour of moderate-intensity exercise per day, totally five hours per week. The oxygen intake of this group improved by an average of 9%. The second group's training sessions were eight 20-second intense workouts followed by ten seconds of rest. Their oxygen intake improved by 15%.

Benefits to health

Good oxygen intake is a sign of a healthy adult but the workout routine has shown other health benefits in diabetes. Scientists at Herriot Watt University in Edinburgh found that short bursts of high-intensity activity every few days reduced the risk of contracting diabetes due to the beneficial effects on blood sugar. Similarly, a study in 2011 by Professor Gibala found that insulin sensitivity improved by 35% after just two weeks, which is important in enabling glucose digested from food to get to our cells and provide energy. Endurance is also increased: one study in 2006 found that eight weeks of doing high-

intensity workouts meant subjects could exercise twice as long as they could before the study, while maintaining the same pace. Additionally, HIT increases the fat burnt and sustains more muscle. Finally, HIT stimulates production of human growth hormone (HGH) by up to 450% during the 24 hours after the workout has finished. HGH is not only responsible for increased calorie burning but also slows down the ageing process. It seems that HIT could keep us fitter and younger for longer.

Questions 13-17

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

13. The traditional view of exercise questions the effectiveness of long periods of activity.

14. Aerobic exercise includes tennis, walking and football.

15. Many people fail to do the recommended amount of exercise.

16. Some now believe that being active for shorter periods is better for our health.

17. HIT involves a 10-minute cool-down period.

Questions 18-22

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

18. Low-intensity activity

A. burns calories after you stop.

B. lets the body store fat.

C. doesn't take much time.

D. uses all the body's energy reserves.

19. High-intensity training

A. retains both muscle and fat tissue.

B. is only good for muscle-building.

C. makes use of under half of our muscles.

D. is done in cycles of rest and activity.

20. In one experiment, participants

A. were all middle aged.

B. were slightly unhealthy.

C. ate a high-fibre diet.

D. were kept in a controlled environment.

21. Researchers measured

A. the air intake.

B. how much TV they watched.

C. how fast they pedalled.

D. how much energy they used.

22. In the Japanese experiment

A. there were two groups of men.

B. the groups trained simultaneously.

C. scientists measured the amount of oxygen used in training.

D. both groups had intensive training sessions.

Questions 23-27

Complete the text below.

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

A study has found that HIT **23.....** the chance of getting diabetes. Another study found that HIT improves **24.....** enabling individuals to exercise for longer periods while **25.....** a similar pace. More fat is **26.....** and the **27.....** of human growth hormone increases enormously.

Bài 9

Questions 28-32

Passage 3 has six paragraphs, A-F.

*Choose the correct heading for paragraphs **B-F** from the list below.*

*Write the correct number, **i-ix**, next to Questions 28-32.*

List of Headings

i. The collapse of the Neanderthal population

ii. The origin of modern humans

iii. Humanity's prehistoric mother

iv. Routes out of Africa

v. Attributes of humans and Neanderthals

vi. The human migration

vii. What did Neanderthals look like?

viii. The diversity of African populations

ix. Tracing back our DNA

Example	Answer
Paragraph A	**ii**

28. Paragraph B

29. Paragraph C

30. Paragraph D

31. Paragraph E

32. Paragraph F

A. Among prehistoric archeologists, Ksar Aqil has an almost mythical status, but the site is little known outside professional circles. The migration of modern humans out of Africa and the Near East's position as a bridge between continents and cultures, as well as nearly a century of scientific research, are all woven into the story of Ksar Aqil. Current perspectives on human evolution and mankind's colonization of the globe are based upon fossil evidence, as well as excavated artifacts and biogenetic data. These lines of inquiry indicate a relatively recent evolution of modern humans, *Homo sapiens sapiens*, in Africa about 200,000 years ago.

B. The latest, and arguably most powerful, analytical tool available to those investigating human origins comes from molecular biology. Geneticists have found that examination of the DNA from tiny structures inside the cell, called mitochondria, provided a means to measure human biogenetic relationships on a time scale spanning hundreds of thousands of years. Mitochondria, also known as the powerhouse of the cell because they generate chemical energy, possess their own genome, and mitochondria! DNA (mtDNA) is inherited exclusively from the mother. Dramatic results released in 1987 by researchers at the University of California at Berkley indicated that all mtDNA present in people today stems from a single female who lived about 200,000 years ago in Africa. This woman was called "Mitochondria! Eve," the genetic mother of all of earth's present-day population.

C. Tens of thousands of years before Beirut became a meeting place of East and West, the Levantine coastal strip and the Arabian Peninsula to the south were corridors through which our common ancestors moved out of Africa and into Asia, Europe, Australia and, lastly, the Americas. The region also has the distinction of being a place where Neanderthals (*Homo sapiens neanderthalensis*) and our immediate ancestors co-existed and indeed

interbred. Although the evolutionary split between Neanderthals and the ancestors of modern humans occurred sometime between 440,000 and 270,000 years ago, according to research, a little Neanderthal DNA, between one and four per cent, exists in all peoples alive today, except for those in Africa. It is probable that our Neanderthal heritage resulted from interbreeding that happened in the Near East sometime between 80,000 and 45,000 years ago.

D. According to proponents of the "out of Africa" theory, the exodus of anatomically modem humans probably occurred in waves. One early migration into the Near East occurred prior to 130,000 years ago, and an examination of a modern map of the Horn of Africa and adjacent parts of Arabia shows there are two obvious routes this migration could have taken. One involves crossing from northern Egypt into the Sinai Peninsula, the other crosses the Bab el-Mandab strait to reach modern-day Yemen, perhaps by watercraft. It is likely that both these routes were taken at different times, as they were navigable, presented no significant hazards and were frequented by the animals our early ancestors tracked and hunted. Given the geographic position of the Near East as a bridge between Europe and Asia, this region formed the trunk through which our family tree branched out from its African roots, both geographically and genetically. When modern humans entered the area over 130,000 years ago, the Neanderthals were in residence, and it seems they curtailed the extent of the newcomers' settlement for a while. When another wave of modern humans began migrating from Africa about 50,000 years ago, perhaps due to population pressure on resources and territory, our ancestors ultimately became the sole inhabitants of places like Ksar Aqil.

E. If this contest had been based on physical strength alone, the Neanderthals would have won hands down. Modern humans, however, had developed cognitive, physical and cultural abilities that provided an advantage, ultimately

leading to the Neanderthals being relegated to geographically marginalized refugees. Neanderthals differed from modern humans in a number of ways, perhaps most noticeably in their skull anatomy, which featured a sloped forehead, a large projection at the back of the skull called an occipital bun, pronounced eyebrow ridges, and no chin. Physically robust and more powerfully built than our ancestors, their massive but relatively short stature was more efficient in cold climates like Europe's. In common with modern humans, they possessed a gene essential for language development, and some paleoanthropologists believe they were capable of complex speech patterns. The Neanderthals apparently were not suited to activities like long-distance running. The energy cost of locomotion was apparently 32 per cent higher in Neanderthals, resulting in a daily dietary requirement between 100 and 350 calories greater than that of modern humans living in similar environmental settings. Our ancestors may, therefore, have had a competitive edge simply by being more fuel-efficient.

F. What exactly happened to the Neanderthals no one knows. Modern peoples migrating into Southwest Asia and on to Europe may have displaced them. Undoubtedly, contact led to a variety of interactions, some clearly resulting in opportunities for interbreeding, others involving physical conflict and competition for resources. The Neanderthals' demise may also have been linked to rapid climatic swings between 50,000 and 30,000 years ago, which created further pressure on their already divided and isolated populations.

Questions 33-39

Classify the following as typical of

A. *Neanderthals*

B. *humans*

C. *both*

*Write the correct letter, **A**, **B** or **C**, next to Questions 33-39.*

33. the ability to develop language

34. the absence of one particular facial feature

35. the ability to run long distances

36. needing to consume lots of calories

37. greater physical strength

38. being small in height

39. making up at least 96% of our genes

Question 40

What is the best title for Reading Passage 3?

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

A. The decline of Neanderthal man

B. The site where humans and Neanderthals met and mixed

C. The migration of humans into Europe

Bài 10

RAINING ICE

In May 2012, disaster struck a mountainous region of China's Gansu province. 40 people were killed and 29,300 people evacuated when a brief but extremely violent hailstone storm swept across Min County. Houses collapsed, roads were blocked and crops were destroyed. The extreme weather also affected the power supply and communications in the region. When you consider that hailstones can reach sizeable proportions, the damage they can cause is understandable. The world's largest hailstone was found after a storm in South Dakota and measured 20.5 cm in diameter with a 47 cm circumference - this was after melting caused it to lose 5 cm from its original size. Apart from China and the US, other parts of the world that frequently suffer from hailstorm damage include Russia, India and northern Italy.

Hail is a form of solid precipitation created within cumulonimbus clouds. Cumulonimbus clouds are caused by heating from below and cooling from above. As the earth is heated during the day by the sun, air close to the ground becomes warmer. Hot air is less dense than cold air and therefore lighter so it rises and, as it does so, it becomes cooler. The warm air reaches a cold point called the condensation level where the water vapor condenses and turns back to a liquid form. As the warm air rises to the condensation level, it becomes less able to keep its moisture and condenses into large clouds, which are often called thunderheads. The process of condensation releases heat into the surrounding air making the air rise even faster and release more moisture. These huge clouds are complex systems in their own right, containing large

amounts of energy resulting in updrafts and downdrafts - vertical winds that can reach speeds over 176 km per hour and help in the formation of hail.

Hail grows in the thunderhead's main updraft where most of the cloud is 'supercooled' water: water that is still liquid even though its temperature is below 0°C. This water will stay in liquid form until it encounters something on which to freeze. There are other particles within the cloud - small frozen raindrops or soft ice particles - called graupel. When the supercooled water hits the graupel, it freezes around it, creating a hailstone. However, this is just the start of the hailstone's journey. A hailstone's eventual size depends upon the intensity of the storm in which it is born. To form a golf ball-sized hailstone requires over ten billion supercooled drops of water and a time span of between five and 10 minutes. This accumulation of additional ice is a process called *accretion* and takes place in areas of the cloud rich in supercooled water. Accretion takes place in two ways, resulting in two distinguishable kinds of hailstone. In the first process, strong updrafts, which lift the top of the cloud into part of the atmosphere known as the troposphere, take the hailstone through the supercooled layer where it accretes ice, making it heavy enough to fall back through the cloud. On falling, it encounters other strong updrafts, which take it back though the supercooled layer where it grows and falls again. An updraft of 35-55 km per hour will form small hailstones; hailstones that are 5 cm in diameter require updrafts of 88 kph and hailstones that are 12 cm in diameter need updrafts of 160 kph to grow. The other process involves the hailstone falling slowly through a layer of the cloud rich in supercooled water.

The first process results in hailstones with concentric layers usually alternating between clear and cloudy ice, indicating how it was produced. The opaque layer forms when supercooled water drops freeze quickly onto the growing hailstone

and trap tiny air bubbles inside the ice giving it a milky appearance. The next layer - the transparent layer - forms when larger drops of supercooled liquid water hit the hailstone. Here the freezing process is slower, allowing air bubbles to escape and clear ice to form. Hailstones showing little of this layering may have been subject to the second process of formation. Instead of being pushed up through the cumulonimbus by updrafts and pulled back through by gravity several times, these hailstones simply fall slowly through the cloud gathering mass as they drop.

The interior of a cumulonimbus cloud is a place of extreme violence. As the hailstones rise and fall, they collide with each other. The result of this can be their breaking up or the formation of large irregular shaped hailstones. Hailstones are categorised according to their size. The Tornado and Storm Research Organisation classifies hailstorms according to their destructive power, ranging from HO - hard hail composed of hailstones of 5 mm in diameter, which do not cause damage - through H5 storms, destructive enough to damage glass, roofs and injure people, to the most severe - H10 or 'super hailstorms', which cause extensive structural damage and can fatally injure people caught out in the open.

The rate at which they fall varies but can be faster than 160 kph for larger hailstones as they become too heavy for the updraft to support or if a downdraft catches them and blows them violently back to earth. It is estimated that between 40 and 70% of hailstones never reach the earth, melting instead inside the cloud, colliding with and smashing into smaller pieces on their way through the air, or melting in the atmosphere to fall as rain.

Questions 1-8

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

TRUE *if the statement agrees with the information*

FALSE *if the statement contradicts the information*

NOT GIVEN *if there is no information on this*

1. Hailstone storms last a long time and cause considerable damage.

2. The world's largest hailstone had lost volume before it was found.

3. Cumulonimbus clouds hold significant quantities of energy.

4. Cumulonimbus clouds are called 'thunderheads' because they are the cause of thunder and lightening storms.

5. Water always turns to ice when it is under 0°C.

6. A slow freezing rate creates clear ice.

7. Hailstones are classified according to their destructive power.

8. Many hailstones stay within the cloud and do not reach the ground.

Questions 9-16

Label the diagram below using words from the box.

*Write the correct letter, **A-H**, in spaces 9-16.*

A. graupel

B. updraft

C. condensation level

D. accretion

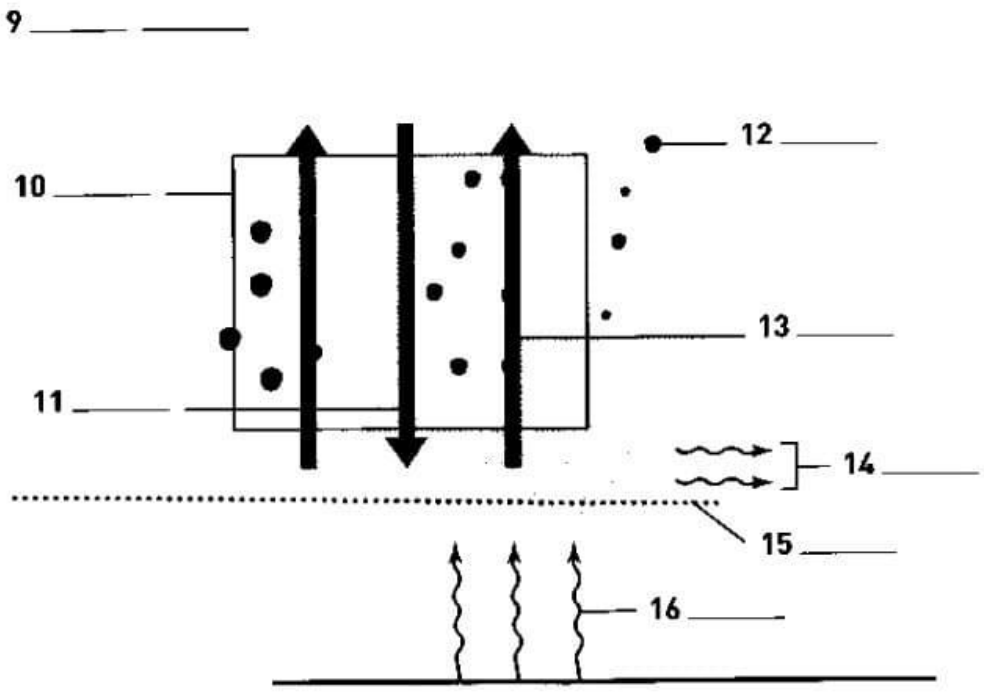
E. heat released into atmosphere

F. downdraft

G. warm air

H. supercooled area

The formation of hailstones in a cloud



Bài 11

TWISTED LIGHT

A. Why is your mobile phone or wireless signal so slow? If you ask your service provider, they'll tell you that it's the bandwidth. We're running out of signal space on the wireless spectrum. All wireless communications travel through radio or optical frequencies: your TV or radio programmes, your GPS device that helps you find your way, your mobile and smartphone, laptop and wirelessly connected PC. The demands from users and industry on a limited resource, the wireless spectrum, are growing daily and are closely regulated. The reason is that two users cannot use the same signal: think about radio stations, which have to operate on different frequencies otherwise they cause interference with each other. Likewise mobile phone operators cannot transit over the same frequency in the same market at the same time. Government-controlled agencies grant licences to use the wireless spectrum but if a wireless company wants to add more spectrum to its service to boost its capacity, it's likely to be disappointed as there isn't much more available. What is needed is a way of pushing more data through the same amount of bandwidth.

B. Now scientists may have found a way of manipulating light waves to carry more information: potentially enough for users to be able to download a film onto a smartphone in a single second. By twisting light waves, scientists could possibly transmit data at speeds of 2.56 terrabits per second: that's 85,000 times faster than the 30 megabits per second currently possible. To put it another way, this is the same as transmitting 70 DVDs through the air in about a second. Researchers based in America, China, Israel and Pakistan have built on previous research from Sweden, which negates the need for more

bandwidth by making better use of the spectrum. The basis of the research is to manipulate the properties of light.

C. One property of light is wavelength: lasers, radio waves, microwaves are simply different wavelengths of light. Light is made up of photons and photons have two other properties that define a beam of light: spin angular momentum and orbital angular momentum. A good way of thinking about how photons travel is to think of the orbit of a planet: it spins around on its axis (spin angular momentum), and at the same time the planet is also revolving around the sun (orbital angular momentum). The latter force means that light can be twisted around its axis of travel to take the shape of a spiral or a corkscrew. At the centre of the spiral the light waves cancel each other out, leaving darkness in the middle, called an optical vortex. When light travels, it is formed into a spiral shape and it can be manipulated. There are infinite possibilities for ways in which the photon can be made to spiral: clockwise, counterclockwise, tight spirals or loose ones. Each of these spiral states can be uniquely identified but, more importantly for wireless communication, the spirals can be wrapped up within each other — or multiplexed — into a single beam. The beam can be transmitted and unwound at the receiving end to get the data streams back out again, essentially doubling or trebling or even quadrupling the bandwidth.

D. Scientists have been twisting light since the 1970s, and the spin angular momentum of waves is already manipulated in standard wireless communication. For years, Bo Thide of the Swedish Institute of Space Physics theorised that the orbital angular momentum could be used to create the spiral signal or as Thiele calls it a 'radio vortex'. Then in an experiment in Venice, his team transmitted two signals simultaneously on the same frequency over a distance of 442 metres. Following on from this, researchers in America, China, Israel and Pakistan, led by Alan Wilner, twisted together eight light data

streams, each stream with its own level of orbital angular momentum twist. One of the streams was transmitted as a thin stream while the others were transmitted around the outside. The data beam was then sent to a receiver and untwisted to recover the data.

E. The achievement is very exciting for developers of wireless network technology as the useful spectrum of frequencies is largely used up. The orbital angular momentum model would allow for an infinite number of data transmissons without taking up any more of the spectrum. There is a problem, however: researchers can only transmit the data stream one metre, which is an insignificant distance for communication purposes. The short transmission range is due to turbulence in the atmosphere, which disrupts the signal as the light hits air molecules. But the scientists are planning to be able to send the beam considerably further. One idea is to create links every kilometre to extend the network. Another is to build high-speed satellite communication links where the atmospheric problems would not affect the signal. Another possibility is to adapt the technology for fibre-optic use, the way data is currently transmitted over the Internet. Unfortunately, at this point standard fibre-optic cables are not capable of carrying multichannel signals and fibre-optic cables that can carry the signal experience problems of interference between channels as they carry data with high bit-rates.

F. Nevertheless, exploiting the orbital angular momentum gives scientists options that could lead to significant increases in data transfer; even a modest increase in the existing data transfer rate is worthwhile. Furthermore, very often technology is pulled along by innovative research so a novel solution to carrying the data-rich signal may not be far behind.

Questions 17-22

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

Which paragraphs contain the following information?

*Write the correct letter, **A-F**, next to Questions 17-22.*

17. changing light waves to increase capacity

18. a practical demonstration of the new technology

19. use of the wireless spectrum needing to be monitored closely

20. overcoming the problem of the short range of the new signal

21. improvements in data transmission possibly leading to technological breakthroughs

22. the prospect of saving people a lot of time

Questions 23-27

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

*Write the correct letter, **A-I**, in spaces 23-27.*

Researchers are looking for a way of using the **23.....** more efficiently. One option is to transmit signals that are twisted into **24.....** and wrapping them together, or **25.....**them. This is still problematic on earth due to **26.....** but scientists hope that **27.....** cable technology will catch up with the research breakthrough.

A. bandwidth	**B.** atmospheric interference	**C.** fibre-optic
D. light waves	**E.** multiplexing	**F.** wireless spectrum
G. spirals	**H.** data streams	**I.** novel

Bài 12

SINKING CITIES

Looking across the Bund towards Pudong across the Huangpu River in Shanghai, you will see an array of modern world-beating skyscrapers. In contrast, behind you are the magnificent buildings from the nineteenth century. Standing on the high tourist promenade that runs the length of the waterfront, you may also notice that the level of the river is quite a bit higher than that of the buildings on the Bund. It isn't because the river has risen higher than usual due to rainfall; no - Shanghai is sinking. It is an unfortunate problem that Shanghai shares with several other major financial and industrial centres and it is caused by factors most of the cities have in common. Included in the list are New York, Bangkok, Houston and Mexico City, all either built on shaky foundations or low-lying land that is now threatened by rising sea levels.

New York and Bangkok are victims of bad luck. The effect of global warming on the sea levels means that these cities may drown in the oceans that brought them such importance and prosperity. Scientists believe that sea levels in the New York area are expected to rise about twice as quickly as in the rest of the world. The position of the city — situated where the Hudson River flows into the Atlantic Ocean — already puts America's most densely populated city at a higher risk of flooding. But the impact of tropical storms and rising tides poses more dangers than just flooding. Beaches in the area will be swept away followed by the surrounding wetlands eventually becoming part of the sea; surrounding river estuaries will see an increase in the salt levels in the fresh water. All of this will affect the ecosystems in New York's immediate area and

damage developments along the coast. Bangkok too will fall victim to rising sea levels. Also situated on swamplands next to a river, the Chao Phraya, the city is about 50 kilometres north of the Gulf of Thailand. The city is likely to face increasingly severe tropical storms crossing from the Bay as well as threats from coastal erosion and shifting clay soil. It seems unlikely that Bangkok will save itself from drowning under the waters of the Pacific, which are predicted to rise by between 19 and 29 cm by 2050.

Other cities are sinking due to bad planning rather than bad luck. The fourth largest city in America is Houston but it has been built on shaky foundations — and these are now giving way. Houston was literally built on a foundation of sand up to several kilometres deep and loosely packed clay from river deposits formed from the erosion of the Rocky Mountains. In addition to poor foundation materials, Houston has an estimated 300 fault lines running through it. Using GPS data from 24 measuring points throughout the country between 1995 to 2005 a research team were able to monitor the area of subsidence and found an area of Houston measuring 30 kilometres squared was sinking very fast — up to 5 centimetres per year. The reason for the subsidence is quite straightforward: the withdrawal of water from deep beneath the surface. Areas of Houston where water extraction has been stopped have stopped sinking. Similarly, parts of Mexico City are subsiding rapidly due to poor foundations — some areas of the city are sinking up to 20 centimetres a year. The city is built on a dry lake bed in the valley of Mexico, and the council has condemned fifty structures since 2006 because of leaning, and approximately 5,000 homes and buildings are unstable. Some of the heaviest buildings, like the Palace of Fine Arts, have sunk more than three metres over the past one hundred years and its original ground floor is now the basement. Again the reason is the depletion of the water reserve lying under the city. But in this case there is a complicating

factor: a vast complex of drains was built under the city to protect it from flooding by water running from the surrounding mountains. As the city sinks, so do the drains and the wastewater they were supposed to carry away is finding its way back to the city. And it's not only water mains and drains that have been affected; as the city sinks the subway network is subsiding with it.

Back in Shanghai, the same problem is causing the city of 13 million people and ultra-modern skyline to sink beneath the waterline of the Huang Pu River. Originally a small fishing village built on swamplands surrounding the mouth of the Yangtze River, Shanghai's population has swollen to around 13 million people. The expansion has been sustained by taking water from wells drilled into the aquifer under the city and by constructing massive skyscrapers. According to China Central Television, Shanghai has sunk up to three metres since the early 1990s mainly due to depletion of underground water but also because of the weight of high-rise buildings situated on areas with soft soil. As a partial solution to the problem, Shanghai is trying to reverse the sinking by pumping 5.2 billion gallons of water a year into the water table with some success — so far the city has risen by almost 11.5 cm.

Questions 28-35

Complete the table below.

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

Write your answers in spaces 28-35.

City	Situated	Cause of sinking	Effect
New York	Where the Hudson meets the Atlantic	The effect of **28**…… and rising tides	Increased chance of **29**……..
Bangkok	On swamps near the Gulf of Thailand	Increasingly damaging storms, **30**…….. and moving soil	A rise in the level of the Pacific of up to **31**…… by 2050
Mexico City	On a **32**…….. that has dried out	Using up the **33**…… beneath the city	Wastewater drains and subway affected
Shanghai	On wetlands around the **34**……. of the Yangtze River	Wells drilled into aquifer and building **35**…….	Sunk up to 3 metres

Questions 36-40

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

36. The thing that may strike you when you are standing on Shanghai's tourist promenade is

A. the contrasting styles of the buildings.

B. its height.

C. that the river is higher than the buildings behind the promenade.

D. that it runs the length of the waterfront.

37. Which of the following is NOT a predicted effect on New York?

A. wetlands becoming part of the ocean

B. beaches being lost

C. developments along the coastline

D. the increasing saltiness of river mouths

38. Houston has been built on

A. shallow sand.

B. material from the Rocky Mountains.

C. volcanic fault lines.

D. accurate GPS measurements.

39. The sinking in Houston

A. affects the whole city equally.

B. is due to water use and the weight of the buildings.

C. has completely stopped.

D. was measured using historical data.

40. Which of the following is NOT true of Mexico City's drains?

A. They were built to defend the city from flooding.

B. They run back to the surrounding mountains.

C. They are sinking with the city.

D. They are carrying wastewater back to the city instead of away from it.

Bài 13

Questions 21-26

*The text below has seven sections, **A-G**.*

*Choose the correct heading for sections **B-G** from the list of headings below.*

*Write the correct number, **i-ix**, next to Questions 21-26.*

List of Headings

i. Our guarantee to you

ii. The application process

iii. A wide choice

iv. Having friends to stay

v. On arrival

vi. A warm welcome from Melborough

vii. Sources of information

viii. Meeting our representatives

ix. Family applicants

Example	*Answer*
Section **A**	**vi**

21. Section B

22. Section C

23. Section D

24. Section E

25. Section F

26. Section G

A HOME FROM HOME AT MELBOROUGH UNIVERSITY!

A. Our relationship with Bechamp Logistics has been a long and fruitful one and we continue to welcome its employees to Melborough University for an education that is second to none. Whether you are about to start a full-time MBA or joining one of our part-time courses, we look forward to welcoming you to the university. We appreciate how important it is that you quickly and easily find somewhere to live during your time here. This leaflet will outline how we work with you to choose the right accommodation.

B. Obtaining suitable accommodation is a priority for those who are leaving their friends, colleagues and family to spend a period of time away from home. For this reason we promise that all Bechamp Logistics employees who have been accepted on a course with us will receive help with accommodation should they need it.

C. If you are planning on relocating during your studies or just renting during the week, we recommend you live on campus as experience has shown this will help you settle into your studies more quickly. We have economy single rooms in our halls of residence, or for those looking for a little more luxury we have Soho House, our dedicated hall for company-sponsored students. Should you prefer to live off campus we can offer you a single-room apartment or rooms in a shared house in the city centre or suburbs.

D. To help you make your choice you will find extensive information on our website with detailed descriptions of all our accommodation including photos and video tours of rooms and halls. You will also find a full price list for the various accommodation types. For people who are able to visit the university before the application deadline, you are welcome to contact our accommodation office for help with viewing places.

E. Students with dependent children can apply for accommodation in any of our dedicated family-friendly halls. There are limited spaces available and you will need to contact us quickly to be sure of obtaining a place on campus. Should these not be available we are always able to help with accommodation off campus. You should go through the application process as usual and be sure to complete the section marked 'dependents'. This will alert our staff to your requirements so they can prioritise your application.

F. Once you have been offered a place at the university you are advised to apply for accommodation immediately. All applications are made online. Once we have received your application we will arrange a time for you to be called by our accommodation office where we will talk to you about your options. Following this conversation, we will either reserve your campus accommodation or represent you should you be looking for a place to live off campus in private accommodation. You will receive written confirmation of your residence no later than two weeks before the start of term.

G. Our accommodation office will be pleased to answer any questions you may have when you arrive at university. Before handing over the keys we ask you to sign a contract outlining your responsibilities. Please note that included in these terms is a commitment to pay for your accommodation for the full academic year.

Please visit the accommodation section of our website for further details.

Bài 14

Questions 27-34

The text below has eight paragraphs, A-H.

Choose the correct headings for sections A-H from the list of headings below.

Write the correct number, i-x, next to questions 27-34.

List of Headings

i. Surprising navigational achievements

ii. Inconsistent data

iii. Setting up the experiment

iv. The bees in action

v. Theories rejected

vi. Achievements explained

vii. Can larger brained creatures achieve the same?

viii. The challenge for previous researchers

ix. Bees versus computers

x. The bees' natural environment

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

UNDERSTANDING THE FLIGHT OF THE BUMBLEBEE

A. Bumblebees are remarkable navigators. While their flight paths may look scattered to the casual eye, all that buzzing about is anything but random. Like the travelling salesman in the famous mathematical problem of how to take the shortest path along multiple stops, bumblebees quickly find efficient routes among flowers. And once they find a good route, they stick to it. The same goes for other animals from hummingbirds to bats to primates that depend on patchy resources such as nectar and fruit. Perhaps this is not such a surprising feat for animals with relatively high brain power. But how do bumblebees, with their tiny brains, manage it? As new research in this issue of *PLOS Biology* by Lars Chittka and colleagues shows, a simple strategy may be enough for a real-world solution to this complex problem.

B. For computers, solving the travelling salesman problem means methodically calculating and comparing the lengths of all possible routes. But such an exhaustive approach isn't feasible in practice, and indeed animals can find a near-optimal foraging route, or trapline, without trying them all. Determining exactly how they do this, however, has been stymied by the difficulties of tracking animals as they forage in the wild. Chittka and colleagues got around this problem by tracking bumblebees (*Bombus terrestris*) on five artificial flowers set in a mown pasture. The “flowers” had landing platforms with drops of sucrose in the middle, and were fitted with motion-triggered webcams.

C. To keep the bees' focus on the artificial flowers, the experiments were done in October, when natural sources of nectar and pollen were scarce. To make the bees want to find all five flowers, each sucrose drop was only enough to fill one-fifth of a bumblebee's crop. And to keep the bees from finding one foraging

site from another visually, the flowers were arranged in a pentagon that was 50 m on each side, which is more than three times farther than bumblebees can see.

D. The researchers released bees individually from a nest box that was about 60 m from the nearest flower, and used the webcams to track the sequence of flower visits during consecutive foraging bouts. The bees found the closest flowers first and added new flowers during subsequent bouts. With experience, they repeated segments of the visitation sequence that shortened the overall route while abandoning those that did not. Traplines linking all five flowers in a short route were established after an average of 26 foraging bouts, which entailed trying only about 20 of the 120 possible routes.

E. In addition, the researchers fitted five bees with transponders and tracked them with radar as they developed traplines. This revealed that flight paths between trapline segments were relatively straight and that between their first and last bouts, bees cut their total travel distance by 80% (from 1,953 to 458 m). In contrast to computers, bees did not find the absolute shortest route of 312 m even in this simple experimental arrangement. But they came very close, which is remarkable considering that they explored only a small fraction of the possible routes, and established traplines relatively rapidly. This tradeoff between perfection and speed highlights the differences between mathematical and biological solutions to the travelling salesman problem.

F. How do bees develop such efficient routes so fast? The researchers assessed three possibilities: that bees optimize foraging routes by visiting flowers in the order of discovery, by shuffling them randomly, or by visiting those that are closest together. But they found that the first two failed to fit their observations while the third did not fully explain them.

G. Rather, the researchers propose that bees optimize foraging routes by combining exploration with learning from previous bouts, which enables the bees to adjust their routes as they find shorter paths. Based on the bees' movements during trapline establishment, the researchers developed a model linking experience to the likelihood of visiting particular flowers. Bees are well known to be able to compute and memorize distances between locations, and the model assumes that they remember the length of the shortest route so far, compare it to the length of the current route, and then choose the shorter of the two. Over time, choosing the more efficient route favors shorter segments over longer ones. The model is a good fit with the researchers' observations, predicting, for example, that bees will develop and stick to optimal routes in 20–25 bouts.

H. Besides shedding light on how bees develop traplines, this work suggests that small-brained animals can use simple methods to solve complex routing problems without the need for cognitive maps of spatial relationships, as has been suggested. It remains to be seen whether big-brained animals can also develop traplines with such elementary tools. But if so, that would free up their brain power for other tasks.

Bài 15

Questions 21-26

The text below has seven paragraphs, A-G.

Choose the correct heading for sections B-G from the list of headings below.

Write the correct number, i-ix, next to Questions 21-26.

List of Headings

i. Help improve our working practices

ii. Become an ambassador

iii. How to get involved

iv. Get to know your colleagues

v. No need to work up a sweat

vi. The equipment you need

vii. Discover our fascinating town

viii. A time to suit everyone

ix. Get back to nature

Example	*Answer*
Paragraph A	iv

21. Paragraph B

22. Paragraph C

23. Paragraph D

24. Paragraph E

25. Paragraph F

26. Paragraph G

Join a Workplace Walking Group

A. Several members of staff have been busy planning a series of lunchtime walks that we are sure you and your colleagues will soon become addicted to. Why join? The reasons are endless. You'll get the chance to chat with close friends and colleagues who participate as you would if you were stuck in your office. But what about all those other people you are on nodding terms with but have yet to get into conversation with? A lunchtime walk will be the perfect opportunity to gel to know each other better.

B. We rarely get the chance to experience work outside of our own department, which obviously isn't healthy for an organisation like ours. So apart form the pleasure you'll get from talking to new people, these lunchtime walks will also give you the chance to get an insight into how other teams and departments work and share experiences of how teams work together, including situations where problems sometimes arise. This may hopefully lead to better communication and more efficient internal systems.

C. We also appreciate that many of you may want to completely switch off from work during your lunch break so we've tried to organise walks that will appeal to everyone. We are situated close to many historical landmarks and one of our walks takes in several of these sites. We've already had one or two employees with an interest in local history volunteer to act as guides, so now's your chance to discover more about where you work.

D. For those who prefer a gentle stroll through the great outdoors we have countryside walks taking in some of the beautiful lanes and fields at the back of the building. You'll be amazed at how tranquil this area can be — experience some lovely views and the sound of birdsong to help you relax before returning to work fully revitalised after lunch. By the way, these walks take in a stop at the

local café for those who'd like to end with a tea or coffee. And there's no need for walking boots as we'll follow landscaped routes.

E. Of course an added benefit is the chance to get away from your desk, clear your head and keep fit. Walking, even at a gentle pace, is regarded as a great way to get into shape and help reduce stress. We also like to think it a pleasurable way to do this for those who don't like the idea of a gym or an aerobics session.

F. We appreciate that people take their lunch breaks at different times and so have organised a staggered timetable so there will always be a spot at least once a week for everyone. However, please feel free to organise a walk independently if you'd like to make it a daily event.

G. All departmental secretaries and managers have signed up already and will be more than pleased to give you any information you need. We also have a 'walking ambassador' in each department who will be able to answer any questions. See the departmental notice board to check for names or watch out for our next email on the subject. If you're convinced and are ready to sign up see if you can encourage some of your colleagues to join you. The more the merrier!

Bài 16

SECTION 3: Questions 27- 40

Read the text below and answer Questions 27-40.

The Carvers of Bukittinggi

The world is becoming increasingly familiar with the products of Indonesia's talented artists. The beautiful batik paintings from Java, the slender wood statues from Bali and the Local jewellery from Sulawasi can be found in shops in New York and Paris. Fortunately, the natural wealth and beauty of the area around the Minangkabau town of Bukittinggi allowed both time and inspiration for the development of crafts, especially weaving, silverwork and wood-carving. Although the wood-carvers of the Minangkabau may not be as well known as some other Indonesian artisans, their strong sense of tradition and of dedication to detail makes for a fascinating story.

Nestled in a high valley between the two volcanic mountains of Merapi and Singgalang is the small village of Pandai Sikek, better known as the "Wood Carving Village". The village is south of Bukittinggi, the cultural centre of the Minangkabau, and east of Padang, the capital of west Sumatra. The terraced rice fields, lush tropical vegetation, cool breezes and abundant water of the Anal Valley have made it an ideal spot for creativity and an inspiration for centuries of wood-carvers. The neighbouring forest provides an abundance of the wood called suriyan, a hard but workable medium for the carvers. Today, more than one hundred carvers claim Pandai Sikek as their home, though only a few can be found at work in the village. Many are away on contract assignments in Malaysia and in major Indonesian cities.

In the village, carvers knee-deep in wood shavings work in little huts along the roadside, Many have two or three apprentices carving repetitive patterns on small items to supplement their incomes. Cigarette boxes, jewellery boxes, ashtrays, bookholders - all can be purchased for sums that seem very modest in relation to the skill involved in making them. Most large items, such as chairs, tables and bed frames, are done on a custom-order basis, and all the shops were busy filling girders, evidence of both the continual need for their craft and the appreciation of their handiwork.

The village's Handicraft Centre is a large framed hall whose outside and inside walls display a wide variety of the wood-carvers' work. The hall is also used as a centre to train future wood-carvers: Recently, 19 students from Sekolah Menengah Seni Rupa, a fine-arts school in Padang, were being instructed, carving the letters of the alphabet and the numbers one to nine. Each student first stencilled a number or letter on a block of wood which he or she then chiselled, carved and sanded to a finished product. The village craftsmen took turns inspecting, advising and encouraging the trainees.

"Pandai" translates as "clever" and Sikek, according to one of several local traditions, is a contraction of *Si Ikek*, the name of a culture hero who introduced wood-carving in the area centuries ago. There are many "pandai" carvers in the village of Pandai Sikek today, such as one known as Bapak (Father or Uncle) Fauzi. His skill was developed through 20 years of memorizing, manipulating and mastering the styles and motifs his uncle taught him. As a young boy, Fauzi would intently watch his uncle's hands as they felt, touched, explored and worked the block of wood until an ornately carved treasure was created. Several years ago, Fauzi was chosen along with many of the other village carvers to work on the Minangkabau Palace of Pagaruyung. It was to be an exact replica of the royal palace destroyed by fire during the early days of Dutch colonial rule,

and would be used as a museum to recall the wealth and artistry of the Minangkabau at the peak of their power. Fauzi jumped at the opportunity, because he would be able to see, learn and recreate many of the historical patterns used in wood-carving.

The patterns used on many Minangkabau wood carvings are believed by anthropologists to have been adapted from stone carvings found scattered about the Anai Valley. The original settlers of the valley, probably Hindus, believed strongly in ancestral and natural spirits, and portrayed these beliefs on the stones. Other patterns came from the artistic interpretation of the carvers as they observed the local flora and fauna. The designs taken from nature, such as the bamboo shoot, fern tendrils and sirih leaf, have been passed down from generation to generation, and have symbolic social and cultural meanings for the Minangkabau.

The early inhabitants arrived in elaborately carved boats, so it was to be expected that they would also carve their houses, and indeed the gables on each end of the roof are decorated with intricately carved wood panels. On these panels adorning the inside walls of their traditional houses, the bamboo-shoot motif is usually placed on the border and is representative of the three male leaders in the Minangkabau culture: the clan chief, the religious leader and the intellectual leader. The fern tendril is thought to represent man as the Father and Uncle, symbolically signifying flexibility to turn inward and outward in dealing with the family unit. The sirih leaf is symbolic of male fertility. The traditional colours painted on the wood carvings of Minangkabau houses also have significance in the culture: Red symbolizes life, black stands for independence and yellow for wisdom.

The Minangkabau can be proud of their past and look forward to new generations of master craftsmen following in the footsteps of present-day

masters. Bapak Fauzi and his fellow carvers now have the responsibility to pass on to the younger generation the traditions and skills they were taught by their elders.

Questions 27-32

Look at the article on the previous pages.

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

27. Indonesia is famous for its wood-carvers.

28. Wood is hard to find near the village.

29. The majority of the wood-carvers work away from their village.

30. It is difficult to become an apprentice.

31. Smaller items are cheap in relation to the skill involved in making them.

32. Craftsmen make some items to suit the requirements of customers.

Questions 33-36

Complete the notes below. Write ***NO MORE THAN THREE WORDS*** *for each answer.*

The Handicraft Centre also functions as a training centre for aspiring **33**.....

Students are given feedback on their work by **34**.....

Pandai Sikek gets its name from the word 'clever' and the name of a **35**.....

Working on an exact copy of a royal palace enabled Fauzi to learn a number of the **36**..... used by carvers in the past.

Questions 37-40

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

37. Wood carvings

A. were originally found all over the Anai Valley.

B. are based on images found on ancient stone carvings.

C. are made out of respect for local spirits.

D. are the same as those found on stone carvings.

38. Designs featuring local plants and wildlife

A. appear in carvings created by several generations of craftsmen.

B. have less symbolic significance than in the past.

C. are interpreted in unusual ways by the wood-carvers.

D. are painted by local artists.

39. The carvings in the houses

A. are copies of designs that originally appeared on boats.

B. feature leaders of the community.

C. are in the form of wall panels.

D. are made from recycled panels from old boats.

40. The fern and sirih leaves

A. represent particular qualities.

B. are painted in different colours.

C. are worn by men who feature in the carvings.

D. only serve a decorative purpose.

Bài 17

Lessons from the Titanic

A. From the comfort of our modern lives, we tend to look back at the turn of the twentieth century as a dangerous time for sea travellers and navigators. With limited communication facilities, and shipping technology still in its infancy in the early nineteen hundreds, we consider ocean travel to have been a risky business. But to the people of the time, it was one of the safest forms of transport. At the time of the Titanic's maiden voyage in 1912, there had only been four lives lost in the previous forty years on passenger ships on the North Atlantic crossing. And the Titanic was confidently proclaimed to be unsinkable. She represented the pinnacle of technological advance at the time. Her builders, crew and passengers had no doubt that she was the finest ship ever built. But still she did sink on April 14, 1912, taking 1,517 of her passengers and crew with her.

B. The RMS Titanic left Southampton for New York on April 10, 1912. On board were some of the richest and most famous people of the time who had paid large sums of money to sail on the first voyage of the most luxurious ship in the world. Imagine her placed on her end: she was larger at 269 metres than many of the tallest buildings of the day. And with nine decks, she was as high as an eleven-storey building. The Titanic carried 329 first-class, 285 second-class and 710 third-class passengers with 899 crew members, under the care of the very experienced Captain Edward J. Smith. She also carried enough food to feed a small town, including 40,000 fresh eggs, 36,000 apples, 111,000 lbs of fresh meat and 2,200 lbs of coffee for the five-day journey.

C. The Titanic was believed to be unsinkable because the hull was divided into sixteen watertight compartments. Even if two of these compartments flooded, the ship could still float. The ship's owners could not imagine that, in the case of an accident, the Titanic would not be able to float until she was rescued. It was largely as a result of this confidence in the ship and in the safety of ocean travel that the disaster could claim such a great loss of life.

D. In the ten hours prior to the Titanic's fatal collision with an iceberg at 11:40 pm, six warnings of icebergs in her path were received by the Titanic's wireless operator. Only one of these messages was formally posted on the bridge; the others were in various locations across the ship. If the combined information in these messages of iceberg positions had been plotted, the ice field which lay across the Titanic's path would have been apparent. Instead, the lack of formal procedures for dealing with information from a relatively new piece of technology, the wireless, meant that the danger was not known until too late. This was not the fault of the Titanic crew. Procedures for dealing with warnings received through the wireless had not been formalised across the shipping industry at the time. The fact that the wireless operators were not even the Titanic crew, but rather contracted workers from a wireless company, made their role in the ship's operation quite unclear.

E. Captain Smith's seemingly casual attitude in increasing the speed on this day to a dangerous 22 knots or 41 kilometres per hour can then be partly explained by his ignorance of what was laying ahead. But this only partly accounts for his actions, since the spring weather in Greenland was known to cause huge chunks of ice to break off from the glaciers. Captain Smith knew that these icebergs would float southward and had already acknowledged this danger by taking a more southerly route than at other times of the year. So why was the Titanic travelling at high speed when he knew, if not of the specific risk,

at least of the general risk of icebergs in her path? As with the lack of coordination of the wireless messages, it was simply standard operating procedure at the time. Captain Smith was following the practices accepted on the North Atlantic, the practices which had coincided with forty years of safe travel. He believed, wrongly as we now know, that the ship could turn or stop in time if an iceberg was sighted by the lookouts.

F. There were around two and a half hours between the time the Titanic rammed into the iceberg and its final submersion. In this time, 705 people were loaded into the twenty lifeboats. There were 473 empty seats available on lifeboats while over 1,500 people drowned. These figures raise two important issues. Firstly, why there were not enough lifeboats to seat every passenger and crew member on board. And secondly, why the lifeboats were not full.

G. The Titanic had sixteen lifeboats and four collapsible boats which could carry just over half the number of people on board her maiden voyage and only a third of the Titanic's total capacity. Regulations for the number of lifeboats required were based on outdated British Board of Trade regulations written in 1894 for ships a quarter of the Titanic's size, and had never been revised. Under these requirements, the Titanic was only obliged to carry enough lifeboats to seat 962 people. At design meetings in 1910, the shipyard's managing director, Alexander Carlisle, had proposed that forty-eight lifeboats be installed on the Titanic, but the idea had been quickly rejected as too expensive. Discussion then turned to the ship's decor, and as Carlisle later described the incident, 'We spent two hours discussing carpet for the first-class cabins and fifteen minutes discussing lifeboats'.

H. The belief that the Titanic was unsinkable was so strong that passengers and crew alike clung to the belief even as she was actually sinking. This attitude was not helped by Captain Smith, who had not acquainted his senior officers

with the full situation. For the first hour after the collision, the majority of people aboard the Titanic, including senior crew, were not aware that she would sink, that there were insufficient lifeboats, or that the nearest ship responding to the Titanic's distress calls would arrive two hours after she was on the bottom of the ocean. As a result, the officers in charge of loading the boats received a very half-hearted response to their early calls for women and children to board the lifeboats. People felt that they would be safer, and certainly warmer, aboard the Titanic than perched in a little boat in the North Atlantic Ocean. Not realising the magnitude of the impending disaster themselves, the officers allowed several boats to be lowered only half full.

I. Procedures again were at fault, as an additional reason for the officers' reluctance to lower the lifeboats at full capacity was that they feared the lifeboats would buckle under the weight of 65 people. They had not been informed that the lifeboats had been fully tested prior to departure. Such procedures as assigning passengers and crew to lifeboats and lifeboat loading drills were simply not part of the standard operation of ships, nor were they included in crew training at this time.

J. As the Titanic sank, another ship, believed to have been the Californian, was seen motionless less than twenty miles away. The ship failed to respond to the Titanic's eight distress rockets. Although the officers of the Californian tried to signal the Titanic with their flashing Morse lamp, they did not wake up their radio operator to listen for a distress call. At this time, communication at sea through wireless was new and the benefits not well appreciated, so the wireless on ships was often not operated around the clock. In the case of the Californian, the wireless operator slept unaware while 1,500 Titanic passengers and crew drowned only a few miles away.

K. After the Titanic sank, investigations were held in both Washington and London. In the end, both inquiries decided that no one could be blamed for the sinking. However, they did address the fundamental safety issues which had contributed to the enormous loss of life. As a result, international agreements were drawn up to improve safety procedures at sea. The new regulations covered 24-hour wireless operation, crew training, proper lifeboat drills, lifeboat capacity for all on board and the creation of an international ice patrol. (1,400 words)

Questions 1-5 (Overview Questions)

Choose the heading which best sums up the primary cause of the problem described in paragraphs D, E, G, H and I of the text. Write the appropriate numbers (i – x) in your booklet.

N.B. There are more heading than paragraphs, so you will not use all of them.

List of Headings

i. Ignorance of the impending disaster
ii. Captain's orders ignored
iii. Captain's over-confidence
iv. Rough sea conditions
v. Faulty design
vi. Iceberg locations not plotted
vii. Low priority placed on safety
viii. Number of lifeboats adequate
ix. Inadequate training
x. Ice warnings ignored

1. Paragraph D
2. Paragraph E
3. Paragraph G
4. Paragraph H
5. Paragraph I

Questions 6 - 10 (Gap-Filling Questions)

Complete the sentences below using words taken from the reading passage. Use NO MORE THAN THREE WORDS for each answer. Write your answers in your booklet.

6. .....did not arouse any response from the Californian.

7. Lifeboats not used.....diminished the opportunity of saving lives.

8. One positive outcome was that the enquiries into the Titanic disaster sought to improve safety procedures by initiating.....

9. The Titanic's safety feature, which convinced most people that she wouldn't sink, was her.....

10. Passenger ships across the North Atlantic Ocean had had an excellent safety record in the.....

Questions 11-17 (Viewpoint Questions)

Do the following statements agree with the views of the writer in the reading passage? In questions 11-17 in your booklet, write:

YES *if the statement agrees with the writer's view;*

NO *if the statement contradicts the writer's view;*

NOT GIVEN *if it is impossible to say what the writer thinks about this.*

11. The enormous loss of life on the Titanic was primarily caused by inadequate equipment, training and procedures.

Answer:.....

12. Nobody had thought of installing enough lifeboats to accommodate all the passengers and crew in the event of an emergency.

Answer:.....

13. Captain Smith didn't inform his officers of the true situation because he didn't want to cause a panic.

Answer:.....

14. The lifeboats would have buckled if they had been fully loaded.

Answer: .....

15. After the Titanic sank, the lifeboats which were not full should have returned to rescue as many people from the water as they could.

Answer: .....

16. The Captain of the Californian would have brought his ship to the rescue if he had realised that the Titanic was sinking.

Answer:.....

17. The sinking of the Titanic prompted an overhaul of standard operating procedures which made ocean travel much safer.

Answer: .....

Question 18-26 (Summary Questions)

Complete the summary below. Choose your answers from words given in the box and write them in your booklet.

N.B. There are more words than spaces, so you will not use them all. You may use any of the words more than once.

List of Words

passengers	dangers	fast	safety	confident
excitement	sink	lifeboats	enormous	record
advanced	inadequate	afloat	size	worried
water	drown	float	handbook	orders
happy	ocean	procedures		

The Finest Ship Ever Built

The North Atlantic Ocean crossing on the Titanic was expected to set a new standard for **(18).....** travel in terms of comfort and **(19).....** The shipping industry had an excellent safety **(20).....** on the North Atlantic Crossing over the previous forty years and the Titanic was the finest and safest liner ever built. The Titanic combined the greatest technology of the day with sheer **(21).....**, luxury and new safety features. The Titanic's owners were **(22).....** that even if the Titanic were letting in **(23).....,** she would **(24).....** indefinitely until help arrived. In hindsight, we know that the Titanic was not unsinkable, and that technology alone could not save lives when facilities were **(25).....** and humans did not follow safe **(26).....** whether because of arrogance or ignorance.

Questions 27-36 (Table-Completion Questions)

Complete the table below using the information from the reading passage. Write NO MORE THAN THREE WORDS for each answer. Write your answers in the table in your booklet.

Problems	**Causes of the problems**	**Remedial measures taken after the disaster? Write Yes, No or Doesn't Say**
Position of icebergs not plotted	**(27)…….** scatterd all over the ship	Doesn't Say
Insufficient lifeboats	**(28)……** regulations	**(29) ……**
Lifeboats not full	a. ignorance of the extent of danger b. fear that lifeboats would **(31) …….**	**(30) ……** **(32) ……**
Californian didn't listen to the distress calls	No **(33) …….** wireless operation	**(34) ……**
Titanic travelling at high speed	**(35) …….** on the North Atlantic	**(36) ……**

Questions 37-40 (Matching Questions)

The reading passage describes a number of cause-and-effect relationships. Match each cause in List A with its effect (A-H) in List B. Write your answers (A-H) after questions 37-40 in your booklet.

N.B. There are more effects in List B than you will need, so you will not use all of them. You may use any effect more than once if you wish.

List A — Causes

37. Outdated regulations designed for much smaller ships

Answer: .....

38. Captain Smith's failure to communicate sufficient information to officers

Answer: .....

39. No requirements for 24-hours-a-day wireless operation

Answer: .....

40. Lack of procedures for dealing with wireless messages

Answer: .....

List B — Effects

A. Lack of lifeboat training and drills

B. More than two of the watertight compartments filled with water

C. Locations of icebergs received in ice warnings were not plotted

D. Half full lifeboats did not return to rescue people

E. Nearby ship did not come to Titanic's rescue

F. Not enough lifeboats

G. Passengers panicked

H. Lifeboats were not fully loaded

Bài 18

You are advised to spend about 20 minutes on this passage.

Warnings to Be Ignored

American banks continue to make vast profits. Will the good times end when the Fed raises interest rates?

Mr. Greenspan's scepticism, you might not be surprised to hear, was warranted. American banks cruised through the downturn following the stockmarket crash of 2000 with barely a dent in the bumper, and since then their profits have accelerated. Last year Citigroup, the largest financial firm in the world, made more money than any other company has ever made before. In the first quarter of this year, it made another $5.3 billion, putting it on course to break last year's record. Bank after bank has announced a sharp increase in profits in the first quarter. And yet bank shares have foundered: the banking bit of the S&P 500 is some 7% off its high. Investors, it seems, doubt whether the good times can continue. And the reason for these fears is a slew of robust economic statistics suggesting that the Federal Government is likely to raise interest rates sooner rather than later. This, they think, will hurt banks.

Though fully in agreement with these views, his dismal track record at the very least requires Buttonwood to put the case for the defence. Far from falling, bank profits could actually rise when the Federal Government puts up rates. All things equal, says David Fanger of Moody's, a rating agency, banks make more money when interest rates are high than when they are low, because they benefit more from paying low or no interest on checking (current) accounts and so forth. The attraction of such cheap sources of funding is the main reason why banks have built up their branch networks in recent years, helping them to

suck in deposits, which have been growing at almost 10% a year. The cheap funding from deposits, says Mr. Fanger, accounts for 25%-40% of profits, depending on the bank. It would mean still more profits were rates to rise.

But while banks' funding will benefit from the rise in short-term rates, they will lose out (in one way, at least) if higher long-term rates do not rise too. Banks essentially take two risks. The first, dubbed 'maturity transformation' risk, involves borrowing short and lending long. The bigger the difference between short- and long-term rates, the more money banks make. Thanks to the largesse of the Fed and its 1% short-term rates, the yield curve — the difference between short and long rates — has been at or near a record high over the past couple of years. The difference between two- and ten-year Treasuries — a good way of measuring the slope of the curve — has been two and a half times its average of the past 20 years, says David Hendler of Credit-Sights, an independent research firm. As a result, he says, 'you could have strapped any monkey to a trading chair and made money.'

Banks have played the yield curve for all they are worth, in the sure knowledge that the Fed will give ample warning before it alters short-term rates. Although commercial lending has dropped, banks' holdings of government securities have grown, as have their investments in mortgage-backed securities, which have gone up by almost $100 billion, or a third, since last September. The market for interest-rate swaps is another favoured playground. Here, banks simply pay a low, short-term floating rate and receive a high, fixed one. Half the top 20 American banks get at least 10% of their profits from this spread, according to Mr. Hendler; for J. P. Morgan Chase, it was an astonishing 33% last year.

The fear, of course, is that banks could lose heavily if long-term rates rise sharply, because the securities that they have bought already would fall in value

(although, of course, they would be able to earn a decent spread on new ones). And many other investors have also taken full advantage of the steep yield curve, which might mean a decidedly nasty fall as they head for the exits at the same time.

Most economists put 'fair value' of ten-year Treasuries at 5.5% or so. This would mean big losses on all those bonds and swaps positions that banks had taken out when rates were a lot lower and prices higher. It would, however, be mainly a valuation loss, and banks might avoid the worst of it by transferring positions to that part of their balance sheet that they do not have to mark to the market price. They would, however, be left with low-yielding assets at a time when the cost of their liabilities in the capital markets was rising. Of course, banks are not stupid: they know that the Fed will raise rates at some point. But the pressure on them to increase profits is so great that most of them have stayed put for as long as possible. All of this means, at the very least, lower profits on existing positions. And if short-term rates rise sharply, as they did in 1994, banks will be in trouble.

But the second risk that banks take — credit risk — is just as big a concern in a rising interest-rate environment. Credit costs have fallen sharply in recent years for consumers and companies alike, thanks to a buoyant economy and low rates. Mr. Fanger argues that those costs are likely to remain low because the Fed will be raising rates at a time when the economy is humming along nicely. But given how high consumer and corporate debts are, and how low the price now charged to lend to riskier borrowers is, such a view seems overly sanguine. You may feel, however, that such warnings can be safely ignored. (921 words)

Questions 1-6

Choose the most suitable heading for each paragraph from the list of headings (A-K) below. Write the appropriate letters (A-K) in the spaces provided after questions 1-6.

N.B. There are more headings than paragraphs, so you will not use all of them.

List of Headings

A. Short-term and long-term interest rates

B. Taking advantage of a record high curve

C. The warning issued by Federal Government

D. Doubt about the sustainable bank profits

E. Fear about sudden policy change

F. Leave the scepticism alone

G. Bank profit losses due to the rise of interest rates

H. The way banks gain profits

I. Theoretical estimate of a long-term gain

J. Rising bank profits with rising interest rates

K. Sharply fallen credit costs

1. Paragraph 1
2. Paragraph 2
3. Paragraph 3
4. Paragraph 4

Example: Paragraph 5 E

5. Paragraph 6
6. Paragraph 7

Questions 7-10

Answer the questions using NO MORE THAN THREE WORDS from the text for each answer. Write your answer in the blank below the question.

7. What are the investors afraid of most in recent months?

.....

8. How have bankers made profits?

.....

9. What are banks trying to make full use of?

.....

10. What banking product is more risky when the interest rates are rising?

.....

Bài 19

You are advised to spend about 20 minutes on this passage.

Just Relax

Section 1

Hypnosis is an intriguing and fascinating process. A trance-like mental state is induced in one person by another, who appears to have the power to command that person to obey instructions without question. Hypnotic experiences were described by the ancient Egyptians and Greeks, while references to deep sleep and anaesthesia have been found in the Bible and in the Jewish Talmud. In the mid-1700s, Franz Mesmer, an Austrian physician, developed his theory of 'animal magnestism', which was the belief that the cause of disease was the 'improper distribution of invisible magnetic fluids'. Mesmer used water tubs and magnetic wands to direct these supposed fluids to his patients. In 1784, a French commission studied Mesmer's claims, and concluded that these cues were only imagined by patients. However, people continued to believe in this process of 'mesmerism' and it was soon realised that successful results could be achieved, but without the need for magnets and water.

Section 2

The term hypnotism was first used by James Braid, a British physician who studied suggestion and hypnosis in the mid-1800s. He demonstrated that hypnosis differed from sleep, that it was a physiological response and not a result of secret powers. During the same period, James Esdaile, a Scottish doctor working in India, used hypnotism instead of anaesthetic in over 200 major surgical operations, including leg amputations. Later that century a

French neurologist, Jean Charcot, successfully experimented with hypnosis in his clinic for nervous disorders.

Section 3

Since then, scientists have shown that the state of hypnosis is a natural human behaviour, which can affect psychological, social and/or physical experiences. The effects of hypnotism depend on the ability, willingness and motivation of the person being hypnotised. Although hypnosis has been compared to dreaming and sleepwalking, it is not actually related to sleep. It involves a more active and intensive mental concentration of the person being hypnotised. Hypnotised people can talk, write, and walk about and they are usually fully aware of what is being said and done.

Section 4

There are various techniques used to induce hypnosis. The best known is a series of simple suggestions repeated continuously in the same tone of voice. The subject is instructed to focus their attention on an object or fixed point, while being told to relax, breathe deeply, and allow the eyelids to grow heavy and close. As the person responds, their state of attention changes, and this altered state often leads to other changes. For example, the person may experience different levels of awareness, consciousness, imagination, memory and reasoning or becoming more responsive to suggestions. Additional phenomena may be produced or eliminated such as blushing, sweating, paralysis, muscle tension or anaesthesia. Although these changes can occur with hypnosis, none of these experiences is unique to it. People who are very responsive to hypnosis are also more responsive to suggestions when they are hypnotised. This responsiveness increases during hypnotism. This explains why hypnosis takes only a few seconds for some, whilst other people cannot be easily hypnotised.

Section 5

It is a common misunderstanding that hypnotists are able to force people to perform criminal or any other acts against their will. In fact, subjects can resist suggestions, and they retain their ability to distinguish right from wrong. This misunderstanding is often the result of public performances where subjects perform ridiculous or highly embarrassing actions at the command of the hypnotist. These people are usually instructed not to recall their behaviour after re-emerging from the hypnotic state, so it appears that they were powerless while hypnotised. The point to remember, however, is that these individuals chose to participate, and the success of hypnotism depends on the willingness of a person to be hypnotised.

Section 6

Interestingly, there are different levels of hypnosis achievable. Thus deep hypnosis can be induced to allow anaesthesia or surgery, childbirth or dentistry. This contrasts to a lighter state of hypnosis, which deeply relaxes the patient who will then follow simple directions. This latter state may be used to treat mental health problems, as it allows patients to feel calm while simultaneously thinking about distressing feelings or painful memories. Thus patients can learn new responses to situations or come up with solutions to problems. This can help recovery from psychological conditions such as anxiety, depression or phobias. Sometime after traumatic incidents, memory of the incidents may be blocked. For example, some soldiers develop amnesia (loss of memory) as a result of their experiences during wartime. Through hypnosis these repressed memories can be retrieved and treated. A variation of this treatment involves age regression, when the hypnotist takes the patient back to a specific age. In this way patients may remember events and feelings from that time, which may be affecting their current well-being.

Section 7

Physicians also have made use of the ability of a hypnotised person to remain in a given position for long periods of time. In one case, doctors had to graft skin onto a patient's badly damaged foot. First, skin from the person's abdomen was grafted onto his arm; then the graft was transferred to his foot. With hypnosis, the patient held his arm tightly in position over his abdomen for three weeks, then over his foot for four weeks. Even though these positions were unusual, the patient at no time felt uncomfortable!

Section 8

Hypnosis occasionally has been used with witnesses and victims of crime to enable people to remember important clues, such as a criminal's physical appearance or other significant details that might help to solve a crime. However, as people can both lie and make mistakes while hypnotised, the use of hypnotism in legal situations can cause serious problems. Also hypnosis cannot make a person divulge secret information if they don't want to. This was confirmed by the Council on Scientific Affairs of American Medical Association, which, in 1985 reported that memories refreshed through hypnosis may include inaccurate information, false memories, and confabulation (fact and fantasy combined) (979 words)

Questions 11-17

The passage has eight sections. Choose the most suitable heading for each section from the list of headings (A-L) below. The first one has been done for you as an example. Write your answers in the spaces provided.

N.B. There are more headings than sections, so you will not use all of them.

Example Answer

Section 1 J

11. Section 2
12. Section 3
13. Section 4
14. Section 5
15. Section 6
16. Section 7
17. Section 8

List of Headings

A. Use of hypnotism in criminal cases

B. The body posture and hypnosis

C. Early medical experiments with hypnotism

D. Early association of hypnotists with psychology

E. Dangers of hypnotism

F. How to hypnotise

G. Hypnosis and free will

H. Difference between mesmerism and hypnotism

I. Therapeutic uses of hypnosis

J. Origins of hypnosis

K. The normality of hypnotised subjects' behaviour

L. Circumspection of hypnotism in legal process

Questions 18-22

Complete the notes of the history of hypnosis using NO MORE THAN THREE WORDS from the passage.

References to hypnotism can be found both in the Talmud and the **(18).....**. Even when Mesmer's **(19).....**were not used, successful results occurred without them. Braid identified hypnosis as a natural **(20).....**response, rather than magical or mystical. Early psychological studies showed the difference between sleep and hypnosis. Successful hypnosis requires the subject's active **(21).....** Consequently subjects can speak or move around and are **(22).....**of their surroundings.

Questions 23-26

Decide which of the alternatives is the correct answer and circle the appropriate letter in your booklet.

23. In order to induce hypnosis, the hypnotist will .....

A. encourage the person to relax using a repetitively even tone of voice.

B. say a specific set of words in a special tone of voice.

C. say any words but in a particular tone of voice.

D. encourage the person to relax while focusing on a slowly moving object.

24. Hypnotised subjects can be instructed to .....

A. do something they have previously said against their wishes.

B. demonstrate physical strength they would normally not have.

C. reveal confidential information against their will.

D. do something that they would not normally be opposed to doing.

25. Past events are recalled under hypnosis .....

A. to entertain the hypnotist.

B. to allow the subject to reassess them without distress.

C. to help the subject improve their memories.

D. to make the subject feel young

26. After surgery, hypnosis may be used .....

A. to make drugs unnecessary.

B. to keep the patient mobile.

C. to make the patient forget to move.

D. to minimise a patient's discomfort while immobile.

Bài 20

You are advised to spend about 20 minutes on this passage.

Money as the Unit of Account

Section I

The most difficult aspect of money to understand is its function as a unit of account. In linear measurement we find the definition of a yard, or a metre, easy to accept. In former times, these lengths were defined in terms of fine lines etched onto brass rods maintained in standards laboratories at constant temperatures. Money is much more difficult to define, however, because the value of anything is ultimately in the mind of the observer, and such values will change with time and circumstance.

Sir Isaac Newton, as Master of the Royal Mint, defined the pound sterling in 1717 as 113 grains of pure gold. This took Britain off silver and onto gold as defining the unit of account. The pound was 113 grains of pure gold, the shilling was 1/20 of that, and the penny 1/240 of it.

By the end of the nineteenth century, the gold standard had spread around most of the trading world, with the result that there was a single world money. It was called by different names in different countries, but all these supposedly different currencies were rigidly interconnected through their particular definition in terms of a quantity of gold.

Section II

In economic life, the prices of different commodities and services are always changing with respect to each other. If the potato crop, for example, is ruined by frost or flood, the price of potatoes will go up. The consequences of that

particular price increase will be complex and unpredictable. Because of the high price of potatoes, prices of other things will decline, as demand for them declines. Similarly, the argument that the Middle East crisis following the Iraqi annexation of Kuwait would, because of increased oil prices, have led to sustained general inflation is, although widely accepted, entirely without foundation. With sound money (money whose purchasing power does not decline over time), a sudden price shock in any one commodity will not lead to a general price increase, but to changes in relative prices throughout the economy. As oil increases, other goods or services will drop in price, and oil substitutes will rise in price, as the consequences of the oil price increase work their unpredictable and complex way through the economy.

The use of gold as a unit of account during the days of the gold standard meant that the price of all other commodities and services would swing up and down with the reference to the price of gold, which was fixed. If gold supplies diminished, as they did when 1850s' gold rushes in California and Australia petered out, the deflation (a general price level decrease) would set in. When new gold rushes followed in South Africa and again in Australia, in the 1880s and 1980s, the general price level increased, gently around the world.

Section III

The end of the gold standard began with the introduction of the Bretton-Woods Agreement in 1946. This fixed the value of all world currencies relative to the US dollar, which in turn was fixed to a specific value of gold (US$0.35/oz). However, in 1971, the US government finally refused to exchange US dollars for gold, and other countries soon followed. Governments printed as much paper money or coinage as they wanted, and the more that was printed, the less each unit of currency was worth.

The key problem with these government 'fiat' currencies is that their value is not defined; such value is subject to how much money a government cares to print. Their future value is unpredictable, depending as it does on political chance. In our economic calculations concerning the past, we automatically convert incomes and expenditures to dollars of a particular year, using CPI deflators which are stored in our computers. When we perform economic calculations into the future, we guess at inflation rates and include these guesses in our figures. Our guesses are entirely based on past experience. In Australia most current calculations assume a 3 to 4 per cent inflation rate.

Section IV

The great advantage of the nineteenth-century gold standard was not just that it defined the unit of account, but that it operated throughout almost the entire world. A price in England was the same as price in Australia and in North America. Anthony Trollope tells us in his diaries about his Australia travels in 1873 that a pound of meat, selling in Australia for two pence, would have cost ten pence or even a shilling in the UK. It was this price difference which drove investment and effort into the development of shipboard refrigeration, and opening up of major new markets for Australian meat, at great benefit to the British public.

Today we can determine price differences between countries by considering the exchange rate of the day. In twelve months' time, even a month's time, however, a totally different situation may prevail, and investments of time and money made on the basis of an opportunity at an exchange rate of the day become completely wasted because of subsequent exchange rate movements. The great advantage of having a single table world money is that such money has very high information content. It tells people where to invest their time,

energy and capital, all around the world, with much greater accuracy and predictability than would otherwise be possible. (879 words)

Glossary:

CPI deflator: a mathematical calculation based on the Consumer Price Index (CPI) that allows us to compare past prices to current prices.

Questions 27-30

The reading passage has four sections. Choose the most suitable heading for each section from the list of headings (i-vi) below. Write the answers in the spaces provided in your booklet.

N.B. There are more headings than sections, so you will not use all of them.

List of Headings

i. The price of gold

ii. The notion of money and its expression

iii. The rise of problematic modern currencies

iv. Stable money compared to modern 'fiat' currencies

v. The effects of inflation

vi. The interrelationship of prices

27. Section I
28. Section II
29. Section III
30. Section IV

Questions 31-35

Using the information from the text, match each of the following causes with an effect. Write the appropriate letter under the question statement.

Causes

31. The price of potatoes goes up.

Answer: .....

32. Oil prices rise.

Answer: .....

33. The amount of gold available went up.

Answer: .....

34. The amount of gold available went down.

Answer:.....

35. Meat in Australia was cheaper than elsewhere.

Answer: .....

Effects

A. Oil substitutes become more expensive.

B. Oil substitutes drop in price.

C. People developed techniques of transporting it to other places.

D. More people went to live in Australia.

E. The prices of other things go down, because fewer people could afford to buy them.

F. People used gold instead of silver as money.

G. All prices went up slightly everywhere.

H. There is no observed effect.

I. All prices went down everywhere.

Questions 36-40

In the reading passage, the writer compares money based on a gold standard and 'fiat' currencies. Using the information in the passage, match the writer's opinions in List 1 with a phrase A, B, or C in List 2 to show which kind of money is meant. Write your answers in the spaces provided.

List 1

36. The writer states that it has a clearly defined value.

Answer: .....

37. The writer states that its value by definition varies over time.

Answer: .....

38. The writer describes its future value as predictable.

Answer: .....

39. The writer knows one can calculate its past value.

Answer:.....

40. The writer believes it makes international investment easier.

Answer: .....

List 2

A. Money based on a gold standard.

B. Government fiat monopoly currencies.

C. Both money based on a gold standard and 'fiat' currencies.

Bài 21

You are advised to spend about 20 minutes on this passage.

The Peacemakers

A non-human example of the cultural transmission of social norms

Is aggressive behaviour innate or learned? In baboons, it seems, it is learned. A surprising natural experiment, reported in *Public Library Of Science Biology*, an online journal, suggests that the level of violence in baboon society is culturally determined.

The story begins in 1983, in the Masai Mara Reserve in Kenya. Robert Sapolslcy, a primatologist at Stanford University, was five years into a study of the reserve's olive baboon population when one of the troops he had been observing suffered an outbreak of tuberculosis which killed half of its males. Since the source of the infection was a garbage dump being used as a food supply, and control of this dump was contested with another troop, the males who became infected and died were the more aggressive individuals in the troop — i.e. those best fitted to the task of fighting for food. The result was that the level of aggressive behaviour within the troop dropped off markedly.

Dr. Sapolsky was understandably upset by what had happened and decided to start again with another troop — one with a more normal sex ratio and social structure. So he turned his attention to a troop 50km away until 1993, when he wanted to show his new colleague (and wife) Lisa Share his original research site. To his surprise, ten years after the natural cull of aggressive individuals

had started, the behaviour of the troop's males was still pacific. The reason for that surprise was that every male who had been in the troop in 1983 — not just the ones who had died of tuberculosis — had gone. All of the troop's males were incomers. (Male olive baboons seek their fortunes in troops other than the ones they have been born into.)

Dr. Sapolsky and Dr. Share decided to investigate further. They began to observe Forest Troop (as Dr. Sapolsky dubbed his original subjects) in detail. They compared the troop's behaviour both to what it had been before the outbreak, and to that of the other troops they had been studying.

Some things had not changed. Top-rank males in all groups stayed boss for roughly the same length of time — a year. So-called approach-avoidance interactions between males, in which a high-ranking male displaces a lower-ranking one without any overt violence, happened about as often in one group as in another. But the detailed pattern of these interactions was different. In the new Forest Troop, males tend to 'pick on individuals their own size', attempting to displace those of adjacent rank, whereas in more traditional groups, top monkeys tend to bully those at least two ranks below them — animals that have no chance of fighting back. The new Forest males are also less likely to launch attacks on females.

Subordinate males in the new Forest Troop are under less physiological stress, too. When Dr. Sapolsky had sampled blood in the pre-outbreak Forest Troop, he had found high levels of hormones called glucocorticoids, which are released in response to stress. Not so in the new Forest Troop. Glucocorticoid levels in

its members are low. In fact, even the act of sampling blood had differentiated high — from low-ranking males in the old days. Dominant males suffered no altered behaviour, whereas sub-ordinates scratched themselves, shook their heads incessantly and ground their teeth. No longer.

Cultural transmission of behaviour has been seen in many animals besides humans. But until now, it has concerned what foodstuffs are good to eat, how to make and use tools, and how to communicate (many bird songs, for example, have learned regional dialects). Cultural transmission of, for want of a better word, manners, has never before been observed outside HOMO SAPIENS.

How it came about is still a bit of a mystery, though when Dr. Sapolsky and Dr. Share weighed the evidence, they felt it supported the idea that males new to the troop somehow picked up on how they were expected to behave by watching what I was going on, and then found life easier if they did likewise. It also seemed to have a lot more to do with how the Forest females treated newcomers, than their treatment by existing Forest males. The females, it seems, like the new arrangement and are keen to preserve it.

However, such pacific behaviour is unusual in baboon troops, which suggests it is an unstable arrangement. In particular, it might be overthrown if several males with different ideas arrived at the same time. Dr. Sapolsky and Dr. Share are therefore watching the troop intently, to see what, if anything, causes its males to revert to the tried and tested macho methods of normal baboon life. (779 words)

Questions 1-7

Do the following statements agree with the views of the writer in the reading passage? In questions 11-17 in your booklet, write:

YES *if the statement agrees with the writer's view;*

NO *if the statement contradicts the writer's view;*

NOT GIVEN *if the statement does not reflect the writer's view.*

1. Baboons are born to be violent by nature.

Answer:.....

2. More aggressive baboons die because of fighting for food.

Answer:.....

3. Incomers of a baboon troop are generally peaceful in their behaviour.

Answer:.....

4. Comparison is the best possible way to study baboon troops.

Answer:.....

5. There is a uniform peaceful transformation of power within a baboon community.

Answer: .....

6. Cultural transmission of a baboon family follows a pre-determined pattern.

Answer:.....

7. Any social norm of a baboon community is very weak and fragile.

Answer: .....

Questions 8-12

Complete the following summary by using NO MORE THAN THREE WORDS from the passage. Write your answers in the spaces provided.

The cultural transmission of a baboon community is revealed by a **(8).....,** which shows that the **(19).....** will decrease when the aggressive baboons die. The scientists compared two groups of baboon troops and found that high-ranking and low-ranking baboons generally interact in the absence of **(10).....**Even though it is still mysterious, the scientists believe that the newcomers' behaviour is **(11).....** by watching others. However, this peaceful life is only **(12).....** if several male baboons want to overthrow it.

Bài 22

You are advised to spend about 20 minutes on this passage.

Team-based Learning

With the globalisation of information technology (IT) and worldwide access to the Internet, people from all areas of learning are finding themselves using some form of information technology in the workplace. The corporate world has seen a boom in the use of IT tools, but conversely not enough people with IT skills can enter the workplace and be productive with minimal on-the-job training.

A recent issue of the *New York Times* reports that many companies are looking for smart students who may have a budding interest in IT. Some companies, trying to encourage students to attend interviews, provide good salary package and challenging work environments. For example, one American IT consulting company offers high salaries, annual bonuses, and immediate stock options to potential recruits. It also brings in 25 to 40 prospective applicants at a time for a two-day visit to the company. This time includes interviews, team exercises and social events. The idea behind the team exercises is that the applicants get to see that they will be working with other smart people doing really interesting things, rather than sitting alone writing code.

In the past 10 years, employers have seen marked benefits from collaborative projects in product development. Apart from the work environment, there is also a similar body of research indicating that small team-based instruction can lead to different kinds of desirable educational results. In order to prepare IT graduates to meet these workplace requirements, colleges and universities are also beginning to include team-based educational models.

One of the leaders in promoting team-based education is the American Intercontinental University (AIU), which has campuses worldwide. AIU offers programmes in IT with a major portion of the curriculum based on team projects. AIU has a large body of international students and students from different educational backgrounds. This team-based learning gives students a sense of social and technical support within a group, and allows students first-hand experience of both potential successes and of inherent problems encouraged when working with others.

Team-oriented instruction has not been the common mode of delivery in traditional college settings. However, since most college graduates who choose to go into an IT work environment will encounter some form of teamwork at work, it is to their advantage that they are educated using collaborative learning and that they are taught the tools needed to work with different people in achieving common goals or objectives.

In team-based learning, students spend a large part of their in-class time working in permanent and heterogeneous teams. Most teams are made up of individuals with different socio-cultural backgrounds and varying skill levels. Team activities concentrate on using rather than just learning concepts, whilst students' grades are a combination of overall team performance and peer evaluation of individual team members.

In a team-based environment, the teacher takes on the role of a facilitator and manager of learning, instead of just providing information to passive students. The facilitator / teacher also guides the team in identifying their goals and establishing standards of team performance. Team exercises then help the students to improve their problem-solving skills by applying theory to simulated real-world situations. Working as a team allows students to adopt new rules and

empowers them to control their own learning. Students in teams are taught to use each other as resources and accept the responsibility of managing tasks.

Team members must also study assigned material individually to ensure their preparation for classes. There are individual assessment tests to measure if students have not only read the assigned material, but also understand the concepts of the module, and can apply them to given problems. Additional team assessment tests present a problem for discussion and require consensus, helping students learn critical communication skills. This also enables them to deal with conflicts between members before they escalate to crisis. Team presentations (written or verbal) allow the team to focus and build cohesion, with team members sharing the responsibility for presenting and persuading the audience to accept their viewpoint. Feedback on how the team is functioning with task management, team dynamics and overall work is given by the facilitator. Team exercises that are application-oriented help students experience the practical application of concepts and learn from other students' perspectives.

Team-based classrooms are especially beneficial in colleges with international students. Since this type of learning encourages people to listen and communicate with others, share problems, resolve personal conflicts, and manage their time and resources, it is a great environment for students who are in a new social situation. Since social interaction plays an important role during teamwork, team-based learning has an added advantage for students who are not comfortable in traditional classroom settings. It allows students from different cultures to understand their differences and use them productively. This type of learning environment also allows students to express themselves freely in a team context, rather than feeling singled out as when answering questions in a traditional classroom.

This learning model was designed to better prepare students for today's global work-place. Students are encouraged to explore ideas together, to build communication skills and achieve superior results. It is likely that employers will increasingly seek out students with these skills as we move into the future. (863 words)

Questions 13-17

Do the following statements reflect the views of the writer in the reading passage? Write your answers in the spaces provided. Choose:

YES *if the statement agrees with the writer's view*

NO *if the statement contradicts the writer's view*

NOT GIVEN *if it is impossible to say what the writer thinks about this*

13. The American Intercontinental University includes team-based learning in all its courses on all its campuses.

Answer:.....

14. The composition of teams is changed regularly.

Answer:.....

15. Theoretical problems are the most important team activity.

Answer:.....

16. The team members participate in assessment of other team members.

Answer:.....

17. International students prefer traditional classroom learning to team-based learning.

Answer: .....

Questions 18-20

Choose one phrase from the list of phrases (A-H) on the next page to complete each of the following sentences. There are more phrases than sentences, so you will not use all of them.

18. Students' work is assessed.
19. The team makes a joint presentation.
20. The need to achieve consensus assists.

List of Phrases

A. to complete with other teams as judged by the facilities
B. by individual tests and exams
C. to see who has the strongest point of view in the group
D. individually, by their peers and as a team
E. in the development of the communication skills
F. to practice working in a group while putting theory into practice
G. to assist intercontinental and non-traditional students
H. in getting to know new friends and colleagues

Questions 21-28

Complete the following summary below. Choose your answers from the box below the summary. There are more words than you will need to fill the gaps. Write your answers in the blanks in your booklet.

Although IT is one of the leading career **(21).....** made by graduates today, the industry's demand for qualified applicants **(22).....** the supply of skilled IT personnel. Despite the **(23).....** widespread use of computer technology in all areas of life, **(24).....** face difficulties recruiting people whose education has equipped them to commence working productively without further training. Several business organisations now offer income and other **(25).....** inducements to potential employees. They also include group **(26).....** in their selection procedures, often inviting up to forty **(27).....**to their company for the two-day visit. In this way, the company can demonstrate the reality of the working **(28).....** which is more likely to invite challenging co-operative projects than individualised tasks.

List of Words

exceeds	previous	environment	employees	admiration
employers	candidates	regularity	advantages	choices
employment	current	extracts	financial	activities

Bài 23

You are advised to spend about 20 minutes on this passage.

Jupiter's Bruises

In 1994 the comet Shoemaker-Levy 9 collided with the planet Jupiter, causing great excitement in the world of astronomy. The article which follows was written after the first impact.

Shoemaker-Levy 9 has plunged into Jupiter, and the Hubble Space Telescope has moved away to look at other objects in space. Amateur astronomers, however, are still watching Jupiter to see what bruises were left on the mighty planet by the comet crash in 1994. There was tremendous excitement in astronomical circles during the collision of comet and planet. It is now time to see what has been learned from this impact.

One question which may never be answered: Was Shoemaker-Levy 9 really a comet, or was it an asteroid instead? Comets tend to be a mixture of ice, rock and dust, along with other substances, like carbon monoxide, that evaporate quickly to form a halo and a tail. Scientists studying the chemical composition of the spots on Jupiter where Shoemaker-Levy 9 (S-L-9) hit thought they might see evidence of water and oxygen, two of the expected products when an icy comet vaporises. But except for one unconfirmed report, researchers have found only ammonia, hydrogen sulphide and sulphur gas.

Asteroids are rockier than comets. Yet it is possible for an asteroid to have a halo or a tail, made mostly of dust. Says Hal Weaver of Space Telescope Institute: ‘The only real evidence that S-L-9 was a comet is that it broke apart, and we’ve never seen that in an asteroid. But maybe this was a fragile asteroid’.

Amateur astronomer David Levy, who with Eugene and Carolyn Shoemaker discovered S-L-9, points out that comets were originally distinguished by their appearance. They are objects that look like fuzzy stars with tails, and in any previous century, astronomers would have called this discovery a comet. On that basis, argues Levy, 'S-L-9 is a comet, period'.

The apparent absence of water at the impact sites provides a clue about how far the S-L-9 fragments penetrated Jupiter's atmosphere before exploding. Theorists think that a layer of water vapour lies some 95km below the visible cloud tops; above the vapour layer, about 50km down, are clouds believed to consist of a sulphur compound. Since no water seems to have been stirred up, the explosion probably took place in the presumed sulphide layer.

If the researchers confirm that the sulphur rose up from Jupiter, it will be 'a major discovery', says University of Arizona astronomer Roger Yelle. 'We've always believed that much of the colour in Jupiter's clouds comes from sulphur compounds, but we've never detected them.'

No one knows why the points of impact are so dark, but it is clear that they are very high up in Jupiter's atmosphere, since the planet stripes can be seen through them. Astronomers believe the collision will provide an opportunity to study the winds above Jupiter's cloud tops. The mark left by the first impact is already starting to be spread around. There are also hints of seismic waves — ripples that many have travelled all the way to a dense layer of liquid hydrogen thousands of kilometres down and then bounced back up to the surface, creating rings half the size of the planet's visible face. These waves may offer clues to Jupiter's internal structure.

The spots that were made by the collision will undoubtedly blow away eventually, but it's much too soon to tell if there will be any permanent changes

in Jupiter. There is still every chance that the impacts, especially from the four fragments that hit in nearly the same place, will destabilise the atmosphere and create a new permanent cyclone like Jupiter's Great Red Spot.

It is also possible that the show isn't quite over. Theorists using a computer model argue that debris has lagged behind the original 21 major fragments. These stragglers, they predict, will keep hitting Jupiter for months to come. Unlike the previous fragments, the latecomer will smash into the near side of the planet, giving astronomers a chance to watch some strikes directly. Is the theory plausible? Says one astronomer, 'We've had so many surprises from S-L-9 already that I wouldn't rule anything out'. (694 words)

Questions 29-35

Do the following statements summarise the opinion of the writer? Write your answer in the space below the statement. Write:

YES *if the statement agrees with the writer's view;*

NO *if the statement does not agree with the writer's view;*

NOT GIVEN *if there is no information about this in the passage.*

29. Evidence so far indicates that further study of Shoemaker-Levy 9 will be worthwhile.

Answer:.....

30. There are no physical differences between asteroids and comets.

Answer: .....

31. The observation of Shoemaker-Levy 9 was an immensely expensive undertaking.

Answer: .....

32. David Levy, being an amateur astronomer, was not taken seriously.

Answer:.....

33. The dark points of impact indicate there is water on Jupiter.

Answer:.....

34. It is now possible to perform detailed studies of Jupiter's internal structure.

Answer:.....

35. It is possible that more impacts have occurred since this article was written.

Answer:.....

Questions 36-40

Complete the sentences below with words taken from the reading passage. Use NO MORE THAN THREE WORDS for each answer.

36. The comet was observed using the .....

37. A comet's tail is usually made up of substances that evaporate quickly such as.....

38. Researchers had expected to see evidence of ..... at the impact site, showing the comet's composition.

39. The presence of sulphur compounds may account for the .....of Jupiter's clouds.

40. The destabilised atmosphere may lead to the formation of another permanent .....on Jupiter.

Bài 24

Air Rage

(A) The first recorded case of an airline passenger turning seriously violent during a flight, a phenomenon now widely known as “air rage”, happened in 1947 on a flight from Havana to Miami. A drunk man assaulted another passenger and bit a flight attendant. However, the man escaped punishment because it was not then clear under whose legal control a crime committed on plane was, the country where the plane was registered or the country where the crime was committed. In 1963, at the Tokyo convention, it was decided that the laws of the country where the plane is registered take precedence.

(B) The frequency of air rage has expanded out of proportion to the growth of air travel. Until recently few statistics were gathered about air rage, but those that have been indicate that passengers are increasingly likely to cause trouble or engage in violent acts. For example, in 1998 there were 266 air rage incidents out of approximately four million passengers, a 400% increase from 1995. In the same period American Airlines showed a 200% rise. Air travel is predicted to rise by 5% internationally by 2010 leading to increased airport congestion. This, coupled with the flying public’s increased aggression, means that air rage may become a major issue in coming years.

(C) Aside from discomfort and disruption, air rage poses some very real dangers to flying. The most extreme of these is when out of control passengers enter the cockpit. This has actually happened on a number of occasions, the worst of which have resulted in the death and injury of pilots or the intruder taking control of the plane, almost resulting in crashes. In addition, berserk passengers sometimes attempt to open the emergency doors while in flight,

putting the whole aircraft in danger. These are extreme examples and cases of air rage more commonly result in physical assaults on fellow passengers and crew such as throwing objects, punching, stabbing or scalding with hot coffee.

(D) The causes of air rage are not known for certain, but it is generally thought that factors include: passenger behavior and personality, the physical environment and changes in society. A recent study has identified the issues that start the incidents to be as follows.

Alcohol	25%
Seating	16%
Smoking	10%
Carry on luggage	9%
Flight attendants	8%
Food	5%

(E) One of the major causes seems to be the passenger's behavior or their personality. Fear of flying and the feeling of powerlessness associated with flying can lead to irritable or aggressive passengers. Also, alcohol consumed on a plane pressurized to 8000ft affects the drinker more quickly and the effects are stronger. Many people do not take account of this and drinking may increase any negative reaction to the flying environment they have, which, combined with the lowering of their inhibitions, may cause air rage. Smoking withdrawal, which some liken in severity to opiate withdrawal, is another major cause of air rage incidents. Passengers caught smoking in the toilets occasionally assault flight attendants and have been known to start fires. When conflicts occur in these conditions, they can escalate into major incidents if the passenger has a violent personality or a fear of flying and because of the

enclosed nature of a plane offers no option of retreat as would be natural in a "fight or flight" reaction.

(F) Some people feel that the physical environment of a plane can lead to air rage. Seats on most airlines have become smaller in recent years as airlines try to increase profits. This leads to uncomfortable and irritated passengers. Also, space for carry on luggage is often very small. Because up to 8% of checked in luggage is lost, misdirected or stolen, passengers have been trying to fit larger carry on items into these small storage areas and this can lead to disputes that can escalate into air rage. Airlines could also be to blame by raising passengers' expectations too high with their marketing and advertising. Many air rage incidents start when disappointed passengers demand to be reseated. Finally, there is some evidence to show that low oxygen levels can raise aggression level and make people feel more desperate. Airlines have lowered oxygen levels to save money. Now the level of oxygen in the air that the pilots breathe is ten times higher than in cabin class.

(G) Another reason that has been suggested is that society is getting ruder and less patient. The increased congestion at airports, longer queues and increased delays have only added to this. In addition, some air rage incidents have been linked to the demanding nature of high achieving business people, who do not like people telling them what to do and resent the power that the cabin staff have over them. For them, a flight attendant is a waiter or waitress who should do what the passenger wants.

(H) The strongest calls for action to control air rage have come from pilots and aircrew. The International Transport Workers' Federation argues that there are too many loopholes that let people escape punishment and that the penalties are too light. They want to notify all passengers of the penalties for air rage before taking off, rather than after the passenger begins to cause serious

problems, when it may be too late. The Civil Aviation Organisation has been organizing international cooperation and penalties have increased in recent years. The most severe punishment so far has been a 51 month jail sentence, a fine to pay for the jet fuel used and 200 hours community service for a man who attempted to enter the cockpit and to open the emergency door of a domestic US flight.

(I) Various other measures are being used to control air rage. Air crew are getting training on how to calm passengers and how to predict where incidents might result in air rage and take action to prevent this. Other measures include, strengthening doors to stop people entering the cockpit, training crew in the use of plastic restraints to tie down unruly passengers and having pilots divert their planes if passengers cause problems. Banning passengers who are guilty of air rage from flying has also been tried to a lesser extent.

Questions 1 — 8

The IELTS reading sample passage has nine paragraphs A — I. From the list below choose the most suitable headings for B — I. Write the appropriate number (i — xiv) beside in boxes 1 — 8 on your answer sheet.

NB. Them are more headings than paragraphs, so you do not have to use them all.

List of headings

i. A decline in the tolerance of passengers.
ii. Disproportionate growth.
iii. Pilots and aircrew cooperate.
iv. Additional action.

v. Smaller seats are the norm.

vi. Laying the blame with the airlines

vii. Origins.

viii. A major threat to travel.

ix. Demands for change.

x. Business people fly more.

xi. New research pinpoints the causes.

xii. The pace of life.

xiii. Passenger at the root of the problems.

xiv. Personal experience.

Example *Answer*

Paragraph A *vii*

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

Questions 9 — 14

Do the following statements agree with the information in the IELTS reading sample text? Mark them as follows.

TRUE *if the statement agrees with the information in the text.*

FALSE *if the statement does not agree with the information in the text.*

NOT GIVEN *if there is no information on this in the text.*

9. In the first case of air rage, one of the reasons the man was not punished was because the plane was not registered.

10. The statistics on air rage were collected by private monitoring groups.

11. The second most common catalyst for incidents is problems with seating.

12. The environment in a plane makes disagreements more likely to become serious problems.

13. Airlines have been encouraging passengers to bring more items onboard as carry-on luggage.

14. There have been no attempts to ban passengers with a history of air rage.