Test 1

LISTENING

PART 1 *Questions 1–10*

Questions 1–6

Complete the notes below.

*Write **NO MORE THAN TWO WORDS AND/OR A NUMBER** for each answer.*

Test Tip Remember that you only hear the recording once.

Check how many words you can use for each answer.

Read through the notes to get an overall idea of their content.

PRESTON PARK RUN

Details of run

Example

Day of Park Run: Saturday

Start of run: in front of the **1** .....

Time of start: **2** .....

Length of run: **3** .....

At end of run: volunteer scans **4** .....

Best way to register: on the **5** .....

Cost of run: **6** £.....

Test Tip You can write a time in figures or words, but figures are quicker and easier.

Study Tip **3** The answer is a distance. Make sure you include the unit of measurement – you can write this in an abbreviated form, e.g. 'km' for kilometres or 'm' for miles.

Questions 7–10

Complete the notes below.

Write ***NO MORE THAN TWO WORDS AND/OR A NUMBER*** for each answer.

Test Tip If part of the answer is given (e.g. $, £, etc.) remember not to repeat it in your answer.

Volunteering

Contact name: Pete **7** .....

Phone number: **8** .....

Activities: setting up course

9 ..... the runners

10 ..... for the weekly report

Test Tip Names are often spelled out on the recording. Make sure you know how all the letters of the English alphabet are pronounced. Listen carefully and write down the letters as you hear them.

Test Tip Check that you have spelled all the answers correctly.

PART 2 *Questions 11–20*

Questions 11–14

Complete the table below.

*Write **NO MORE THAN THREE WORDS AND/OR A NUMBER** for each answer.*

PACTON-ON-SEA BUS TOUR		
Bus stops	**Location**	**Things to see**
Bus stop 1	train station	start of tour
Bus stop 2	the aquarium	dolphins and **11** .....
Bus stop 3	**12**	yachts and power boats
Bus stop 4	**13** ..... centre	very old **14** .....

Test Tip Look carefully at the table before you listen. Note the headings at the top – they tell you what you need to listen for. Use all the information provided in the table to help you predict answers.

You hear the answers in the same order as the questions.

Use the words that you hear to answer the questions.

Study Tip
11 'dolphins' is plural so the answer to this question is also likely to be plural – don't forget the 's'.

Study Tip **14** You may hear a synonym of 'very old' on the recording (e.g. 'ancient'). Don't repeat it in your answer.

Questions 15–20

Complete the sentences below.

*Write **NO MORE THAN TWO WORDS AND/OR A NUMBER** for each answer.*

15 You need to have a ..... to buy a ticket for £10.

16 The bus tour lasts ..... in total.

17 The cost of the bus ticket includes entrance to the ..... .

18 You can listen to an audio commentary which has been made by the ..... .

19 If the weather is wet, it is a good idea to bring ..... .

20 Don't forget to bring your ..... when you book online.

Test Tip Read the sentences through in the preparation time and think about what type of information is missing.

Study Tip 18 If you do not know the phrase 'audio commentary', use the context and other words in the sentence to help you decide what it means, e.g. 'It is something you listen to on a tour bus'.

Study Tip Check that all the sentences are grammatically correct and make sense, e.g. don't repeat 'the' before your answer to Question 18.

PART 3 *Questions 21–30*

Questions 21–26

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

21 Dave Hadley says that the computer system has

A too many users.
B never worked well.
C become outdated.

22 The main problem with the computer system is that it

A is too slow.
B stops working.
C displays incorrect data.

23 Timetabling has become an issue because

A there is not enough time for anyone to do it.
B the system does not handle course options.
C the courses are constantly changing.

24 To solve the timetabling issues, Randhir suggests that

A students should create their own timetables.
B Dave should have someone to assist him.
C the number of courses should be reduced.

25 Randhir says that a new system may

A need to be trialled.
B still have problems.
C be more economical.

26 Improving the existing system will take

A a few weeks.
B four or five months.
C nine months.

Study Tip Read the questions through and underline important words that tell you what to listen for, e.g. 'main problem' in Question 22.

Study Tip 23 In addition to noting important words in the question ('Timetabling', 'issue'), you need to pick out the important words in the options ('not enough time', 'system', 'not handle', 'options', 'courses', 'changing').

Study Tip 25 Are any of the options positive or negative? Do the speakers' voices sound positive or negative? This may help you answer the question.

Questions 27–30

Complete the flow-chart below.

*Write **NO MORE THAN TWO WORDS** for each answer.*

Next steps

Get approval from **27** .....

↓

Complete a **28** ..... form

↓

Book a **29** ..... with the systems analyst

↓

Set up a **30** ..... with technologies team

Test Tip Check the number of words you can use, and read through the flow-chart to understand the process.

What type of information is missing in each gap? Are the answers likely to be plural or singular?

Study Tip **29 & 30**
You can predict answers before you listen, but be careful! Why is 'appointment' incorrect for Question 29? What other answers are possible?

Test Tip Read back through the flow-chart and check your answers for both meaning and spelling.

PART 4 *Questions 31–40*

Complete the sentences below.

Write ***NO MORE THAN TWO WORDS AND/OR A NUMBER*** *for each answer.*

Ceramics

31 Ceramics date back approximately ..... .

32 The first figurines were made in the area of ..... .

33 Early humans could not use their pots to store ..... .

34 The Chinese improved the quality of ceramics by mixing ..... with the clay.

35 Chinese porcelain was also called ..... .

36 Bottger added quartz and ..... to clay to make porcelain.

Glass

37 Glass production is similar to clay ceramics apart from the rate of ..... .

38 The Romans introduced the use of glass to make ....

Concrete

39 The discovery of concrete is probably due to observing reactions of water and ..... .

40 The ability to build large ..... contributed to the success of the Roman Empire.

Test Tip There is no break in this part. Read all ten sentences carefully in the preparation time.

Study Tip 31 Think of the sentences as questions, e.g. 'When did ceramics start?' This can help you think of words and phrases to listen for.

Study Tip 32–34 The answer to Question 32 is a place. What type of information is missing in the next two questions?

Study Tip Use the headings 'Ceramics', 'Glass' and 'Concrete' to help you keep your place as you listen.

Test Tip Make sure that the grammar of the completed sentences is correct.

Check there are no unnecessary words.

Check spellings and use of plural 's'.

READING

Test Tip Aim to complete the questions in the recommended time.

There are usually two or three sets of questions in each section.

Each correct answer scores one mark.

READING PASSAGE 1

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

The Dover Bronze-Age Boat

A beautifully preserved boat, made around 3,000 years ago and discovered by chance in a muddy hole, has had a profound impact on archaeological research.

It was 1992. In England, workmen were building a new road through the heart of Dover, to connect the ancient port and the Channel Tunnel, which, when it opened just two years later, was to be the first land link between Britain and Europe for over 10,000 years. A small team from the Canterbury Archaeological Trust (CAT) worked alongside the workmen, recording new discoveries brought to light by the machines.

At the base of a deep shaft six metres below the modern streets a wooden structure was revealed. Cleaning away the waterlogged site overlying the timbers, archaeologists realised its true nature. They had found a prehistoric boat, preserved by the type of sediment in which it was buried. It was then named the Dover Bronze-Age Boat.

About nine metres of the boat's length was recovered; one end lay beyond the excavation and had to be left. What survived consisted essentially of four intricately carved oak planks: two on the bottom, joined along a central seam by a complicated system of wedges and timbers, and two at the side, curved and stitched to the others. The seams had been made watertight by pads of moss, fixed by wedges and yew stitches.

The timbers that closed the recovered end of the boat had been removed in antiquity when it was abandoned, but much about its original shape could be deduced. There was also evidence for missing upper side planks. The boat was not a wreck, but had been deliberately discarded, dismantled and broken. Perhaps it had been 'ritually killed' at the end of its life, like other Bronze-Age objects.

With hindsight, it was significant that the boat was found and studied by mainstream archaeologists who naturally focused on its cultural context. At the time, ancient boats were often considered only from a narrower technological perspective, but news about the Dover boat reached a broad audience. In 2002, on the tenth anniversary of the discovery, the Dover Bronze-Age Boat Trust hosted a conference, where this meeting of different traditions became apparent. Alongside technical papers about the boat, other speakers explored its social and economic contexts, and the religious perceptions of boats in Bronze-Age societies. Many speakers came from overseas, and debate about cultural connections was renewed.

Within seven years of excavation, the Dover boat had been conserved and displayed, but it was apparent that there were issues that could not be resolved simply by studying the old wood. Experimental archaeology seemed to be the solution: a boat reconstruction, half-scale or full-sized, would permit assessment of the different hypotheses regarding its build and the missing end. The possibility of returning to Dover to search for the boat's unexcavated northern

end was explored, but practical and financial difficulties were insurmountable – and there was no guarantee that the timbers had survived the previous decade in the changed environment.

Detailed proposals to reconstruct the boat were drawn up in 2004. Archaeological evidence was beginning to suggest a Bronze-Age community straddling the Channel, brought together by the sea, rather than separated by it. In a region today divided by languages and borders, archaeologists had a duty to inform the general public about their common cultural heritage.

The boat project began in England but it was conceived from the start as a European collaboration. Reconstruction was only part of a scheme that would include a major exhibition and an extensive educational and outreach programme. Discussions began early in 2005 with archaeological bodies, universities and heritage organisations either side of the Channel. There was much enthusiasm and support, and an official launch of the project was held at an international seminar in France in 2007. Financial support was confirmed in 2008 and the project then named BOAT 1550BC got under way in June 2011.

A small team began to make the boat at the start of 2012 on the Roman Lawn outside Dover museum. A full-scale reconstruction of a mid-section had been made in 1996, primarily to see how Bronze-Age replica tools performed. In 2012, however, the hull shape was at the centre of the work, so modern power tools were used to carve the oak planks, before turning to prehistoric tools for finishing. It was decided to make the replica half-scale for reasons of cost and time, and synthetic materials were used for the stitching, owing to doubts about the scaling and tight timetable.

Meanwhile, the exhibition was being prepared ready for opening in July 2012 at the Castle Museum in Boulogne-sur-Mer. Entitled 'Beyond the Horizon: Societies of the Channel & North Sea 3,500 years ago', it brought together for the first time a remarkable collection of Bronze-Age objects, including many new discoveries for commercial archaeology and some of the great treasure of the past. The reconstructed boat, as a symbol of the maritime connections that bound together the communities either side of the Channel, was the centrepiece.

Questions 1–5

Complete the flow-chart below.

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

Write your answers in boxes 1–5 on your answer sheet.

Key events

1992 – the boat was discovered during the construction of a **1** .....

↓

2002 – an international **2** ..... was held to gather information

↓

2004 – **3** ..... for the reconstruction were produced

↓

2007 – the **4** ..... of BOAT 1550BC took place

↓

2012 – the Bronze-Age **5** ..... featured the boat and other objects

Test Tip Quickly read through the flow-chart to understand the process. Note that in this task you can only write one word for each answer.

Test Tip Dates are easy to find in the passage because they stand out. Use them to help you quickly find the right part of the passage for each question.

All the answers must be words that are in the passage.

Questions 6–9

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

In boxes 6–9 on your answer sheet, write

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

6 Archaeologists realised that the boat had been damaged on purpose.

7 Initially, only the technological aspects of the boat were examined.

8 Archaeologists went back to the site to try and find the missing northern end of the boat. ⁻1

9 Evidence found in 2004 suggested that the Bronze-Age Boat had been used for trade. ⁻1

Test Tip The questions are in passage order, but the answers may not be evenly spread across the passage.

The difference between a FALSE and a NOT GIVEN statement is that a FALSE statement says the opposite of what is stated in the passage.

Questions 10–13

Answer the questions below.

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

Write your answers in boxes 10–13 on your answer sheet.

Study Tip Which words in the statement are important and help you find the answer?

10 How far under the ground was the boat found?

11 What natural material had been secured to the boat to prevent water entering?

12 What aspect of the boat was the focus of the 2012 reconstruction?

13 Which two factors influenced the decision not to make a full-scale reconstruction of the boat?

Test Tip You may have to go back to the beginning of the passage when you start a new set of questions.

Note how many words you can use in your answers.

READING PASSAGE 2

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

Test Tip Read the title and introduction of the passage and decide what the main topic is.

Some passages are divided into paragraphs that have clear themes. You may have to match paragraphs to headings or find information in the paragraphs. Always do a quick read of these questions first. Then quickly read the passage to get an overall idea of the content.

The changing role of airports

Airports continue to diversify their role in an effort to generate income. Are business meeting facilities the next step? Nigel Halpern, Anne Graham and Rob Davidson investigate.

A

In recent times developing commercial revenues has become more challenging for airports due to a combination of factors, such as increased competition from Internet shopping, restrictions on certain sales, such as tobacco, and new security procedures that have had an impact on the dwell time of passengers. Moreover, the global economic downturn has caused a reduction in passenger numbers while those that are travelling generally have less money to spend. This has meant that the share of revenue from non-aeronautical revenues actually peaked at 54% at the turn of the century and has subsequently declined slightly. Meanwhile, the pressures to control the level of aeronautical revenues are as strong as ever due to the poor financial health of many airlines and the rapid rise of the low-cost carrier sector.

B

Some of the more obvious solutions to growing commercial revenues, such as extending the merchandising space or expanding the variety of shopping opportunities, have already been tried to their limit at many airports. A more radical solution is to find new sources of commercial revenue within the terminal, and this has been explored by many airports over the last decade or so. As a result, many terminals are now much more than just shopping malls and offer an array of entertainment, leisure, and beauty and wellness facilities. At this stage of facilities provision, the airport also has the possibility of taking on the role of the final destination rather than merely a facilitator of access.

C

At the same time, airports have been developing and expanding the range of services that they provide specifically for the business traveller in the terminal. This includes offering business centres that supply support services, meeting or conference rooms and other space for special events. Within this context, Jarach (2001) discusses how dedicated meetings facilities located within the terminal and managed directly by the airport operator may be regarded as an expansion of the concept of airline lounges or as a way to reconvert abandoned or underused areas of terminal buildings. Previously it was primarily airport hotels and other facilities offered in the surrounding area of the airport that had the potential to take on this role and become active as a business space (McNeill, 2009).

D

When an airport location can be promoted as a business venue, this may increase the overall appeal of the airport and help it become more competitive in both attracting and retaining airlines and their passengers. In particular, the presence of meeting facilities could become one of the determining factors taken into consideration when business people are choosing airlines and where they change their planes. This enhanced attractiveness itself may help to improve the airport operator's financial position and future prospects, but clearly this will be dependent on the competitive advantage that the airport is able to achieve in comparison with other venues.

E

In 2011, an online airport survey was conducted and some of the areas investigated included the provision and use of meeting facilities at airports and the perceived role and importance of these facilities in generating income and raising passenger numbers. In total, there were responses from staff at 154 airports and 68% of these answered 'yes' to the question: Does your airport own and have meetings facilities available for hire? The existence of meeting facilities therefore seems high at airports. In addition, 28% of respondents that did not have meeting facilities stated that they were likely to invest in them during the next five years. The survey also asked to what extent respondents agreed or disagreed with a number of statements about the meeting facilities at their airport. 49% of respondents agreed that they have put more investment into them during recent years; 41% agreed that they would invest more in the immediate future. These are fairly high proportions considering the recent economic climate.

F

The survey also asked airports with meeting facilities to estimate what proportion of users are from the local area, i.e. within a 90-minute drive from the airport, or from abroad. Their findings show that meeting facilities provided by the majority of respondents tend to serve local versus non-local or foreign needs. 63% of respondents estimated that over 60% of users are from the local area. Only 3% estimated that over 80% of users are from abroad. It is therefore not surprising that the facilities are of limited importance when it comes to increasing use of flights at the airport: 16% of respondents estimated that none of the users of their meeting facilities use flights when travelling to or from them, while 56% estimated that 20% or fewer of the users of their facilities use flights.

G

The survey asked respondents with meeting facilities to estimate how much revenue their airport earned from its meeting facilities during the last financial year. Average revenue per airport was just $12,959. Meeting facilities are effectively a non-aeronautical source of airport revenue. Only 1% of respondents generated more than 20% non-aeronautical revenue from their meetings facilities; none generated more than 40%. Given the focus on local demand, it is not surprising that less than a third of respondents agreed that their meeting facilities support business and tourism development in their home region or country.

H

The findings of this study suggest that few airports provide meetings facilities as a serious commercial venture. It may be that, as owners of large property, space is available for meeting facilities at airports and could play an important role in serving the needs of the airport, its partners, and stakeholders such as government and the local community. Thus, while the local orientation means that competition with other airports is likely to be minimal, competition with local providers of meetings facilities is likely to be much greater.

Questions 14–18

The text has eight paragraphs, **A–H.**

Which paragraph contains the following information?

Write the correct letter, ***A–H,*** *in boxes 14–18 on your answer sheet.*

N.B. *You may use any letter more than once.*

Test Tip There is only one correct answer for each question so some paragraphs may not be tested.

If you are told that 'you may use any letter more than once', it means that the answer to two (occasionally three) questions may be found in the same paragraph.

14 evidence that a significant number of airports provide meeting facilities C

15 a statement regarding the fact that no further developments are possible in some areas of airport trade

16 reference to the low level of income that meeting facilities produce for airports

17 mention of the impact of budget airlines on airport income

18 examples of airport premises that might be used for business purposes

Study Tip 14 In this question, you are looking for 'evidence', which is likely to be in the form of data. Which paragraphs contain data? Which of these paragraphs provides data about the number of airports with meeting facilities?

Questions 19–22

Complete the sentences below.

Choose ***NO MORE THAN TWO WORDS*** *from the text for each answer. Write your answers in boxes 19–22 on your answer sheet.*

19 The length of time passengers spend shopping at airports has been affected by updated _____ .

20 Airports with a wide range of recreational facilities can become a _____ for people rather than a means to travel.

21 Both passengers and _____ may feel encouraged to use and develop a sense of loyalty towards airports that market their business services.

22 Airports that supply meeting facilities may need to develop a _____ over other venues.

Study Tip 16 The important word is 'income'. Which paragraph discusses the 'low level' generated by meeting facilities?

Study Tip 18 You need to find examples so think about the sorts of things these might be.

Test Tip Read through each sentence and underline words that will help you find the right place in the passage.

Questions 23–26

Complete the summary below.

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

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

Survey Findings

Despite financial constraints due to the **23** ..... , a significant percentage of airports provide and wish to further support business meeting facilities. Also, just under 30% of the airports surveyed plan to provide these facilities within **24** ..... .

However, the main users of the facilities are **25** ..... and as many as 16% of respondents to the survey stated that their users did not take any **26** ..... at the airport.

Test Tip Re-read the summary with the gaps completed. Check that it makes sense and is a true reflection of what is stated in the passage.

Test Tip Use the title of the summary to find the right place in the passage. The summary may cover one paragraph or several paragraphs.

Read through the summary, underlining important words. The answers may not come in the same order in the passage as the questions.

Study Tip 24 Find a figure that is 'just under thirty per cent'.

Study Tip
25 Rephrase the first part of the sentence: 'Who are the main users of airport facilities?' Find the part of the passage that discusses this.

READING PASSAGE 3

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

IS PHOTOGRAPHY ART?

This may seem a pointless question today. Surrounded as we are by thousands of photographs, most of us take for granted that, in addition to supplying information and seducing customers, camera images also serve as decoration, afford spiritual enrichment, and provide significant insights into the passing scene. But in the decades following the discovery of photography, this question reflected the search for ways to fit the mechanical medium into the traditional schemes of artistic expression.

The much-publicized pronouncement by painter Paul Delaroche that the daguerreotype* signalled the end of painting is perplexing because this clever artist also forecast the usefulness of the medium for graphic artists in a letter written in 1839. Nevertheless, it is symptomatic of the swing between the outright rejection and qualified acceptance of the medium that was fairly typical of the artistic establishment. Discussion of the role of photography in art was especially spirited in France, where the internal policies of the time had created a large pool of artists, but it was also taken up by important voices in England. In both countries, public interest in this topic was a reflection of the belief that national stature and achievement in the arts were related.

From the maze of conflicting statements and heated articles on the subject, three main positions about the potential of camera art emerged. The simplest, entertained by many painters and a section of the public, was that photographs should not be considered 'art' because they were made with a mechanical device and by physical and chemical phenomena instead of by human hand and spirit; to some, camera images seemed to have more in common with fabric produced by machinery in a mill than with handmade creations fired by inspiration. The second widely held view, shared by painters, some photographers, and some critics, was that photographs would be useful to art but should not be considered equal in creativeness to drawing and painting. Lastly, by assuming that the process was comparable to other techniques such as etching and lithography, a fair number of individuals realized that camera images were or could be as significant as handmade works of art and that they might have a positive influence on the arts and on culture in general.

Artists reacted to photography in various ways. Many portrait painters – miniaturists in particular – who realized that photography represented the '**handwriting on the wall**' became involved with daguerreotyping or paper photography in an effort to save their careers; some incorporated it with painting, while others renounced painting altogether. Still other painters, the most prominent among them the French painter, Jean-Auguste-Dominique Ingres, began almost immediately to use photography to make a record of their own output and also to provide themselves with source material for poses and backgrounds, vigorously denying at the same time its influence on their vision or its claims as art.

The view that photographs might be worthwhile to artists was enunciated in considerable detail by Lacan and Francis Wey. The latter, an art and literary critic, who eventually recognised that camera images could be inspired as well as informative, suggested that they would lead to greater naturalness in the graphic depiction of anatomy, clothing, likeness, expression, and landscape. By studying photographs, true artists, he claimed, would be relieved of menial tasks and become free to devote themselves to the more important spiritual aspects of their work.

Wey left unstated what the incompetent artist might do as an alternative, but according to the influential French critic and poet Charles Baudelaire, writing in response to an exhibition of photography in 1859, lazy and untalented painters would become photographers. Fired by a belief in art as an imaginative embodiment of cultivated ideas and dreams, Baudelaire regarded photography as 'a very humble servant of art and science'; a medium largely unable to transcend 'external reality'. For this critic, photography was linked with 'the great industrial madness' of the time, which in his eyes exercised disastrous consequences on the spiritual qualities of life and art.

Eugene Delacroix was the most prominent of the French artists who welcomed photography as help-mate but recognized its limitations. Regretting that 'such a wonderful invention' had arrived so late in his lifetime, he still took lessons in daguerreotyping, and both commissioned and collected photographs. Delacroix's enthusiasm for the medium can be sensed in a journal entry noting that if photographs were used as they should be, an artist might 'raise himself to heights that we do not yet know'.

The question of whether the photograph was document or art aroused interest in England also. The most important statement on this matter was an unsigned article that concluded that while photography had a role to play, it should not be 'constrained' into 'competition' with art; a more stringent viewpoint led critic Philip Gilbert Hamerton to dismiss camera images as 'narrow in range, emphatic in assertion, telling one truth for ten falsehoods'.

These writers reflected the opposition of a section of the cultural elite in England and France to the 'cheapening of art' which the growing acceptance and purchase of camera pictures by the middle class represented. Technology made photographic images a common sight in the shop windows of Regent Street and Piccadilly in London and the commercial boulevards of Paris. In London, for example, there were at the time some 130 commercial establishments where portraits, landscapes, and photographic reproductions of works of art could be bought. This appeal to the middle class convinced the elite that photographs would foster a desire for realism instead of idealism, even though some critics recognized that the work of individual photographers might display an uplifting style and substance that was consistent with the defining characteristics of art.

** the name given to the first commercially successful photographic images*

Questions 27–30

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

Write your answers in boxes 27–30 on your answer sheet.

Test Tip Read the questions and underline words that will help you find the right part of the passage.

27 What is the writer's main point in the first paragraph?

Study Tip 27 Read the first paragraph carefully and underline the main idea. Which of the options expresses this?

- **A** Photography is used for many different purposes.
- **B** Photographers and artists have the same principal aims.
- **C** Photography has not always been a readily accepted art form.
- **D** Photographers today are more creative than those of the past.

28 What public view about artists was shared by the French and the English?

- **A** that only artists could reflect a culture's true values
- **B** that only artists were qualified to judge photography
- **C** that artists could lose work as a result of photography
- **D** that artistic success raised a country's international profile

Study Tip 29 The phrase in inverted commas is in bold in the passage. Read around it to find out what it means.

29 What does the writer mean in line 59 by 'the handwriting on the wall'?

- **A** an example of poor talent
- **B** a message that cannot be trusted
- **C** an advertisement for something new
- **D** a signal that something bad will happen

30 What was the result of the widespread availability of photographs to the middle classes?

- **A** The most educated worried about its impact on public taste.
- **B** It helped artists appreciate the merits of photography.
- **C** Improvements were made in photographic methods.
- **D** It led to a reduction in the price of photographs.

Questions 31–34

*Complete the summary of Paragraph 3 using the list of words, **A–G**, below.*

Write your answers in boxes 31–34 on your answer sheet.

A	inventive	**C**	beneficial	**E**	mixed	**G**	inferior
B	similar	**D**	next	**F**	justified		

Test Tip Read the instructions carefully. Sometimes you are told which paragraph to read. You can also use the title of the summary to find the right place.

Camera art

In the early days of photography, opinions on its future were **31** ..... , but three clear views emerged. A large number of artists and ordinary people saw photographs as **32** ..... to paintings because of the way they were produced. Another popular view was that photographs could have a role to play in the art world, despite the photographer being less **33** ..... . Finally, a smaller number of people suspected that the impact of photography on art and society could be **34** ..... .

Study Tip
31 'opinions' and 'views' in the first sentence have a similar meaning. Which word at the start of Paragraph 3 also has this meaning? Which of the options expresses the views when photography began?

Questions 35–40

*Look at the following statements and the list of people, **A–E**, below.*

Match each statement with the correct person.

*Write the correct letter, **A–E**, in boxes 35–40 on your answer sheet.*

35 He claimed that photography would make paintings more realistic.

36 He highlighted the limitations and deceptions of the camera.

37 He documented his production of artwork by photographing his works.

38 He noted the potential for photography to enrich artistic talent.

39 He based some of the scenes in his paintings on photographs.

40 He felt photography was part of the trend towards greater mechanisation.

Test Tip If there are more statements than names, you will have to use one of the names twice.

A	Jean-Auguste-Dominique Ingres	**C**	Charles Baudelaire
B	Francis Wey	**D**	Eugene Delacroix
		E	Philip Gilbert Hamerton

Test 2

LISTENING

PART 1 *Questions 1–10*

Questions 1–6

Complete the notes below.

*Write **NO MORE THAN TWO WORDS AND/OR A NUMBER** for each answer.*

Short Story Competition

Entry Details

Example

Cost of entry: £5

Length of story: approximately **1** .....

Story must include: a **2** .....

Minimum age: **3** .....

Last entry date: 1st **4** .....

Web address: www. **5** ..... .com

Don't: **6** ..... the story to the organisers

Questions 7–10

Complete the sentences below.

*Write **NO MORE THAN TWO WORDS** for each answer.*

Judging and Prize Details

The competition is judged by **7** ..... .

The top five stories will be available **8** ..... .

The top story will be chosen by the **9** ..... .

The first prize is a place at a writers' workshop in **10** ..... .

PART 2 *Questions 11–20*

Questions 11–17

Answer the questions below.

*Write **NO MORE THAN THREE WORDS** for each answer.*

Sea Life Centre – information

11 What was the Sea Life Centre previously called? .....

12 What is the newest attraction called? .....

13 When is the main feeding time? .....

14 What can you do with a VIP ticket? .....

15 What special event will the Sea Life Centre arrange for you? .....

16 Where will the petition for animal conservation be sent to? .....

17 What can you use to test what you have learnt? .....

Questions 18–20

What does the guide say about each attraction?

*Choose **THREE** answers from the box and write the correct letter, **A–E**, next to Questions 18–20.*

A	Aquarium
B	Crocodile Cave
C	Penguin Park
D	Seal Centre
E	Turtle Town

18 must not miss .....

19 temporarily closed .....

20 large queues .....

PART 3 *Questions 21–30*

Questions 21–22

*Choose **TWO** letters, **A–E**.*

*Which **TWO** subjects did Martina like best before going to university?*

A	Art	**B**	English	**C**	French
D	History	**E**	Science		

Questions 23–26

Complete the summary below.

*Write **NO MORE THAN TWO WORDS** for each answer.*

George's experience of university

George is studying Mechanical Engineering which involves several disciplines. He is finding **23** ..... the most difficult. At the moment, his course is mainly **24** ..... . He will soon have an assignment which involves a study of **25** ..... . He thinks there are too many **26** ..... and would like less of them.

Questions 27–30

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

27 Martina thinks the students at her university are

- **A** sociable.
- **B** intelligent.
- **C** energetic.

28 George hopes that his tutor will help him

- **A** lose his shyness.
- **B** settle into university.
- **C** get to know his subject better.

29 What does Martina know about her first assignment?

- **A** the topic
- **B** the length
- **C** the deadline

30 George would like to live

- **A** in a hall of residence.
- **B** in a flat on his own.
- **C** with a host family.

PART 4 *Questions 31–40*

Complete the notes below.

Write ***NO MORE THAN TWO WORDS*** *for each answer.*

Preparing and Giving a Presentation

Initial thoughts

Most important consideration: your audience

Three points to bear in mind:

- what they need to know
- how **31** ..... they will be
- how big the audience will be

Structure

Start with information that makes the audience **32** .....

End with **33** .....

Design

The presentation needs to be **34** .....

Vary content by using a mix of words and **35** .....

Presenting

Look at the audience, be enthusiastic and energetic

Voice – vary speed and **36** .....

Occasionally add **37** ..... for greater impact

Do not use **38** ..... (e.g. *appears*, *seems*)

Questions and Interruptions

When asked a question, first of all you should **39** .....

Minimise interruptions by **40** ..... them

READING PASSAGE 1

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

The Flavor of Pleasure

When it comes to celebrating the flavor of food, our mouth gets all the credit. But in truth, it is the nose that knows.

No matter how much we talk about tasting our favorite flavors, relishing them really depends on a combined input from our senses that we experience through mouth, tongue and nose. The taste, texture, and feel of food are what we tend to focus on, but most important are the slight puffs of air as we chew our food – what scientists call 'retronasal smell'.

Certainly, our mouths and tongues have taste buds, which are receptors for the five basic flavors: sweet, salty, sour, bitter, and umami, or what is more commonly referred to as savory. But our tongues are inaccurate instruments as far as flavor is concerned. They evolved to recognise only a few basic tastes in order to quickly identify toxins, which in nature are often quite bitter or acidly sour.

All the complexity, nuance, and pleasure of flavor come from the sense of smell operating in the back of the nose. It is there that a kind of alchemy occurs when we breathe up and out the passing whiffs of our chewed food. Unlike a hound's skull with its extra long nose, which evolved specifically to detect external smells, our noses have evolved to detect internal scents. Primates specialise in savoring the many millions of flavor combinations that they can create for their mouths.

Taste without retronasal smell is not much help in recognising flavor. Smell has been the most poorly understood of our senses, and only recently has neuroscience, led by Yale University's Gordon Shepherd, begun to shed light on its workings. Shepherd has come up with the term 'neurogastronomy' to link the disciplines of food science, neurology, psychology, and anthropology with the savory elements of eating, one of the most enjoyed of human experiences.

In many ways, he is discovering that smell is rather like face recognition. The visual system detects patterns of light and dark and, building on experience, the brain creates a spatial map. It uses this to interpret the interrelationship of the patterns and draw conclusions that allow us to identify people and places. In the same way, we use patterns and ratios to detect both new and familiar flavors. As we eat, specialised receptors in the back of the nose detect the air molecules in our meals. From signals sent by the receptors, the brain understands smells as complex spatial patterns. Using these, as well as input from the other senses, it constructs the idea of specific flavors.

This ability to appreciate specific aromas turns out to be central to the pleasure we get from food, much as our ability to recognise individuals is central to the pleasures of social life. The process is so embedded in our brains that our sense of smell is critical to our enjoyment of life at large. Recent studies show that people who lose the ability to smell become socially insecure, and their overall level of happiness plummets.

Working out the role of smell in flavor interests food scientists, psychologists, and cooks alike. The relatively new discipline of molecular gastronomy, especially, relies on understanding the mechanics of aroma to manipulate flavor for maximum impact. In this discipline, chefs use their knowledge of the chemical changes that take place during cooking to produce eating pleasures that go beyond the 'ordinary'.

However, whereas molecular gastronomy is concerned primarily with the food or 'smell' molecules, neurogastronomy is more focused on the receptor molecules and the brain's spatial images for smell. Smell stimuli form what Shepherd terms 'odor objects', stored as memories, and these have a direct link with our emotions. The brain creates images of unfamiliar smells by relating them to other more familiar smells. Go back in history and this was part of our survival repertoire; like most animals, we drew on our sense of smell, when visual information was scarce, to single out prey.

Thus the brain's flavor-recognition system is a highly complex perceptual mechanism that puts all five senses to work in various combinations. Visual and sound cues contribute, such as crunching, as does touch, including the texture and feel of food on our lips and in our mouths. Then there are the taste receptors, and finally, the smell, activated when we inhale. The engagement of our emotions can be readily illustrated when we picture some of the wide-ranging facial expressions that are elicited by various foods – many of them hard-wired into our brains at birth. Consider the response to the sharpness of a lemon and compare that with the face that is welcoming the smooth wonder of chocolate.

The flavor-sensing system, ever receptive to new combinations, helps to keep our brains active and flexible. It also has the power to shape our desires and ultimately our bodies. On the horizon we have the positive application of neurogastronomy: manipulating flavor to curb our appetites.

Questions 1–5

Complete the sentences below.

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

Write your answers in boxes 1–5 on your answer sheet.

1 According to scientists, the term ..... characterises the most critical factor in appreciating flavour.

2 'Savoury' is a better-known word for ..... .

3 The tongue was originally developed to recognise the unpleasant taste of ..... .

4 Human nasal cavities recognise ..... much better than external ones.

5 Gordon Shepherd uses the word 'neurogastronomy' to draw together a number of ..... related to the enjoyment of eating.

Questions 6–9

Complete the notes below.

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

Write your answers in boxes 6–9 on your answer sheet.

Face recognition	patterns of dark and light are used to put together a **6**	→	the brain identifies faces	facial recognition is key to our enjoyment of **7** .....
Smell	receptors recognise the **8** ..... in food	→	the brain identifies certain **9**	smell is key to our enjoyment of food

Questions 10–13

Answer the questions below.

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

Write your answers in boxes 10–13 on your answer sheet.

10 In what form does the brain store 'odor objects'?

11 When seeing was difficult, what did we use our sense of smell to find?

12 Which food item illustrates how flavour and positive emotion are linked?

13 What could be controlled in the future through flavour manipulation?

READING PASSAGE 2

*You should spend about 20 minutes on **Questions 14–26**, which are based on Reading Passage 2 on the following pages.*

Questions 14–19

The text on the following pages has six paragraphs, **A–F**.

Choose the correct heading for each paragraph from the list of headings (i–ix) below.

*Write the correct number, **i–ix**, in boxes 14–19 on your answer sheet.*

List of Headings

- **i** Tackling the issue using a different approach
- **ii** A significant improvement on last time
- **iii** How robots can save human lives
- **iv** Examples of robots at work
- **v** Not what it seemed to be
- **vi** Why timescales are impossible to predict
- **vii** The reason why robots rarely move
- **viii** Following the pattern of an earlier development
- **ix** The ethical issues of robotics

14 Paragraph A

15 Paragraph B

16 Paragraph C

17 Paragraph D

18 Paragraph E

19 Paragraph F

Dawn of the robots

They're already here – driving cars, vacuuming carpets and feeding hospital patients. They may not be walking, talking, human-like sentient beings, but they are clever… and a little creepy.

A At first sight it looked like a typical suburban road accident. A Land Rover approached a Chevy Tahoe estate car that had stopped at a kerb; the Land Rover pulled out and tried to pass the Tahoe just as it started off again. There was a crack of fenders and the sound of paintwork being scraped, the kind of minor mishap that occurs on roads thousands of times every day. Normally drivers get out, gesticulate, exchange insurance details and then drive off. But not on this occasion. No one got out of the cars for the simple reason that they had no humans inside them; the Tahoe and Land Rover were being controlled by computers competing in November's DARPA (the U.S. Defence Advanced Research Projects Agency) Urban Challenge.

B The idea that machines could perform to such standards is startling. Driving is a complex task that takes humans a long time to perfect. Yet here, each car had its on-board computer loaded with a digital map and route plans, and was instructed to negotiate busy roads; differentiate between pedestrians and stationary objects; determine whether other vehicles were parked or moving off; and handle various parking manoeuvres, which robots turn out to be unexpectedly adept at. Even more striking was the fact that the collision between the robot Land Rover, built by researchers at the Massachusetts Institute of Technology, and the Tahoe, fitted out by Cornell University Artificial Intelligence (AI) experts, was the only scrape in the entire competition. Yet only three years earlier, at DARPA's previous driverless car race, every robot competitor – directed to navigate across a stretch of open desert – either crashed or seized up before getting near the finishing line.

C It is a remarkable transition that has clear implications for the car of the future. More importantly, it demonstrates how robotics sciences and Artificial Intelligence have progressed in the past few years – a point stressed by Bill Gates, the Microsoft boss who is a convert to these causes. 'The robotics industry is developing in much the same way the computer business did 30 years ago,' he argues. As he points out, electronics companies make toys that mimic pets and children with increasing sophistication. 'I can envision a future in which robotic devices will become a nearly ubiquitous part of our day-to-day lives,' says Gates. 'We may be on the verge of a new era, when the PC will get up off the desktop and allow us to see, hear, touch and manipulate objects in places where we are not physically present.'

D What is the potential for robots and computers in the near future? 'The fact is we still have a way to go before real robots catch up with their science fiction counterparts,' Gates says. So what are the stumbling blocks? One key difficulty is getting robots to know their place. This has nothing to do with class or etiquette, but concerns the simple issue of positioning. Humans orient themselves with other objects in a room very easily. Robots find the task almost impossible. 'Even something as simple as telling the difference between an open door and a window can be tricky for a robot,' says Gates. This has, until recently, reduced robots to fairly static and cumbersome roles.

E For a long time, researchers tried to get round the problem by attempting to re-create the visual processing that goes on in the human cortex. However, that challenge has proved to be singularly exacting and complex. So scientists have turned to simpler alternatives: 'We have become far more pragmatic in our work,' says Nello Cristianini, Professor of Artificial Intelligence at the University of Bristol in England and associate editor of the *Journal of Artificial Intelligence Research*. 'We are no longer trying to re-create human functions. Instead, we are looking for simpler solutions with basic electronic sensors, for example.' This approach is exemplified by vacuuming robots such as the Electrolux Trilobite. The Trilobite scuttles around homes emitting ultrasound signals to create maps of rooms, which are remembered for future cleaning. Technology like this is now changing the face of robotics, says philosopher Ron Chrisley, director of the Centre for Research in Cognitive Science at the University of Sussex in England.

F Last year, a new Hong Kong restaurant, Robot Kitchen, opened with a couple of sensor-laden humanoid machines directing customers to their seats. Each possesses a touch-screen on which orders can be keyed in. The robot then returns with the correct dishes. In Japan, University of Tokyo researchers recently unveiled a kitchen 'android' that could wash dishes, pour tea and make a few limited meals. The ultimate aim is to provide robot home helpers for the sick and the elderly, a key concern in a country like Japan where 22 per cent of the population is 65 or older. Over US$1 billion a year is spent on research into robots that will be able to care for the elderly. 'Robots first learn basic competence – how to move around a house without bumping into things. Then we can think about teaching them how to interact with humans,' Chrisley said. Machines such as these take researchers into the field of socialised robotics: how to make robots act in a way that does not scare or offend individuals. 'We need to study how robots should approach people, how they should appear. That is going to be a key area for future research,' adds Chrisley.

Questions 20–23

Look at the following statements (Questions 20–23) and the list of people below.

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

Write the correct letter in boxes 20–23 on your answer sheet.

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

A Bill Gates
B Nello Cristianini
C Ron Chrisley

20 An important concern for scientists is to ensure that robots do not seem frightening.

21 We have stopped trying to enable robots to perceive objects as humans do.

22 It will take considerable time for modern robots to match the ones we have created in films and books.

23 We need to enable robots to move freely before we think about trying to communicate with them.

Questions 24–26

Complete the notes below.

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

Write your answers in boxes 24–26 on your answer sheet.

Robot features

DARPA race cars:	**24** ..... provides maps and plans for route
Electrolux Trilobite:	builds an image of a room by sending out **25** .....
Robot Kitchen humanoids:	have a **26** ..... to take orders

READING PASSAGE 3

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

It's your choice! – Or is it really?

As we move from the industrial age to the information age, societal demands on our mental capabilities are no less taxing ...

We are constantly required to process a wide range of information to make decisions. Sometimes, these decisions are trivial, such as what marmalade to buy. At other times, the stakes are higher, such as deciding which symptoms to report to the doctor. However, the fact that we are accustomed to processing large amounts of information does not mean that we are better at it (Chabris & Simons, 2009). Our sensory and cognitive systems have systematic ways of failing of which we are often, perhaps blissfully, unaware.

Imagine that you are taking a walk in your local city park when a tourist approaches you asking for directions. During the conversation, two men carrying a door pass between the two of you. If the person asking for directions had changed places with one of the people carrying the door, would you notice? Research suggests that you might not. Harvard psychologists Simons and Levi (1998) conducted a field study using this exact set-up and found that the change in identity went unnoticed by 7 (46.6%) of the 15 participants. This phenomenon has been termed 'change blindness' and refers to the difficulty that observers have in noticing changes to visual scenes (e.g. the person swap), when the changes are accompanied by some other visual disturbance (e.g. the passing of the door).

Over the past decade, the change blindness phenomenon has been replicated many times. Especially noteworthy is an experiment by Davies and Hine (2007) who studied whether change blindness affects eyewitness identification. Specifically, participants were presented with a video enactment of a burglary. In the video, a man entered a house, walking through the different rooms and putting valuables into a knapsack. However, the identity of the burglar changed after the first half of the film while the initial burglar was out of sight. Out of the 80 participants, 49 (61%) did not notice the change of the burglar's identity, suggesting that change blindness may have serious implications for criminal proceedings.

To most of us, it seems bizarre that people could miss such obvious changes while they are paying active attention. However, to catch those changes, attention must be targeted to the changing feature. In the study described above, participants were likely not to have been expecting the change to happen, and so their attention may have been focused on the valuables the burglar was stealing rather than the burglar.

Drawing from change blindness research, scientists have come to the conclusion that we perceive the world in much less detail than previously thought (Johansson, Hall, & Sikström, 2008). Rather than monitoring all of the visual details that surround us, we seem to focus our attention only on those features that are currently meaningful or important, ignoring those that are irrelevant to our current needs and goals. Thus at any given time, our representation of the world surrounding us is crude and incomplete, making it possible for changes or manipulations to go undetected (Chabris & Simons, 2010).

Given the difficulty people have in noticing changes to visual stimuli, one may wonder what would happen if these changes concerned the decisions people make. To examine choice blindness, Hall and colleagues (2010) invited supermarket customers to sample two different kinds of jams and teas. After participants had tasted or smelled both samples, they indicated which one they preferred. Subsequently, they were purportedly given another sample of their preferred choice. On half of the trials, however, these were samples of the non-chosen jam or tea. As expected, only about one-third of the participants detected this manipulation. Based on these findings, Hall and colleagues proposed that choice blindness is a phenomenon that occurs not only for choices involving visual material, but also for choices involving gustatory and olfactory information.

Recently, the phenomenon has also been replicated for choices involving auditory stimuli (Sauerland, Sagana, & Otgaar, 2012). Specifically, participants had to listen to three pairs of voices and decide for each pair which voice they found more sympathetic or more criminal. The voice was then presented again; however, the outcome was manipulated for the second voice pair and participants were presented with the non-chosen voice. Replicating the findings by Hall and colleagues, only 29% of the participants detected this change.

Merckelbach, Jelicic, and Pieters (2011) investigated choice blindness for intensity ratings of one's own psychological symptoms. Their participants had to rate the frequency with which they experienced 90 common symptoms (e.g. anxiety, lack of concentration, stress, headaches etc.) on a 5-point scale. Prior to a follow-up interview, the researchers inflated ratings for two symptoms by two points. For example, when participants had rated their feelings of shyness, as 2 (i.e. *occasionally*), it was changed to 4 (i.e. *all the time*). This time, more than half (57%) of the 28 participants were blind to the symptom rating escalation and accepted it as their own symptom intensity rating. This demonstrates that blindness is not limited to recent preference selections, but can also occur for intensity and frequency.

Together, these studies suggest that choice blindness can occur in a wide variety of situations and can have serious implications for medical and judicial outcomes. Future research is needed to determine how, in those situations, choice blindness can be avoided.

Questions 27–31

Do the following statements agree with the claims of the writer in the text?

In boxes 27–31 on your answer sheet, write

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

27 Doctors make decisions according to the symptoms that a patient describes.

28 Our ability to deal with a lot of input material has improved over time.

29 We tend to know when we have made an error of judgement.

30 A legal trial could be significantly affected by change blindness.

31 Scientists have concluded that we try to take in as much detail as possible from our surroundings.

Questions 32–36

Complete the table below.

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

Write your answers in boxes 32–36 on your answer sheet.

Experiments in change blindness

Researchers	Purpose of experiment	Situation for participants	Focus of participants' attention	Percentage unaware of identity change
Simons & Levi, 1998	to illustrate change blindness caused by a **32** ....., such as an object	giving **33** ..... to a stranger	the movement of **34**	46.6%
Davies & Hine, 2007	to assess the impact of change blindness on **35** ..... by eyewitnesses	watching a burglary	the collection of **36**	61%

Questions 37–38

*Choose **TWO** letters, **A–E**.*

*Which **TWO** statements are true for both the supermarket and volcano experiments?*

Write your answers in boxes 37–38 on your answer sheet.

A The researchers focused on non-visual material.

B The participants were asked to explain their preferences.

C Some of the choices made by participants were altered.

D The participants were influenced by each other's choices.

E Percentage results were surprisingly low.

Questions 39–40

*Choose **TWO** letters, **A–E**.*

*Which **TWO** statements are true for the psychology experiment conducted by Merckelbach, Jelicic, and Pieters?*

Write your answers in boxes 39–40 on your answer sheet.

A The participants had to select their two most common symptoms.

B The participants gave each symptom a 1–5 rating.

C Shyness proved to be the most highly rated symptom.

D The participants changed their minds about some of their ratings.

E The researchers focused on the strength and regularity of symptoms.

Test 3

LISTENING

PART 1 *Questions 1–10*

Questions 1–5

Complete the form below.

*Write **NO MORE THAN TWO WORDS AND/OR A NUMBER** for each answer.*

SARAH'S HEALTH & FITNESS CLUB
MEMBERSHIP FORM

Example	
First name:	Harry
Last name:	**1** .....
Date of Birth:	Day: *11th*; Month: *December*; Year: **2** .....
Type of Membership:	**3** .....
Activities:	*Badminton* and **4** .....
Payment details:	Total: £450
	To be paid **5** .....

Questions 6–10

Answer the questions below.

*Write **NO MORE THAN TWO WORDS** for each answer.*

Lifestyle questionnaire

What exercise do you do regularly?	**6** .....
Do you have any injuries?	*has a* **7** .....
What is your goal or target?	*a better* **8** .....
What is your occupation?	*a* **9** .....
How did you hear about the club?	**10** .....

PART 2 *Questions 11–20*

Questions 11–14

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

11 The next event at the hotel will be a

A trade fair.
B wedding.
C party.

12 The number of guests will be

A less than 50.
B from 50 to 100.
C more than 100.

13 Guests will start arriving at

A 7.15.
B 7.30.
C 7.45.

14 The entertainment will be a

A live band.
B comedian.
C magician.

Questions 15–17

Who will be responsible for the following jobs as the guests arrive?

*Choose **THREE** answers from the box and write the correct letter, **A–E**, next to Questions 15–17.*

A	Susan
B	Ahmed
C	Gary
D	Olav
E	Monica

15 offer drinks to guests .....

16 take guests' coats and hats .....

17 show guests where to go .....

Questions 18–20

Complete the sentences below.

*Write **NO MORE THAN THREE WORDS** for each answer.*

General instructions

In order to get the guests to move to the restaurant the hotel manager will **18** ..... .

Seating plans will be placed on each table and also in the **19** ..... .

There will be a total of three **20** ..... .

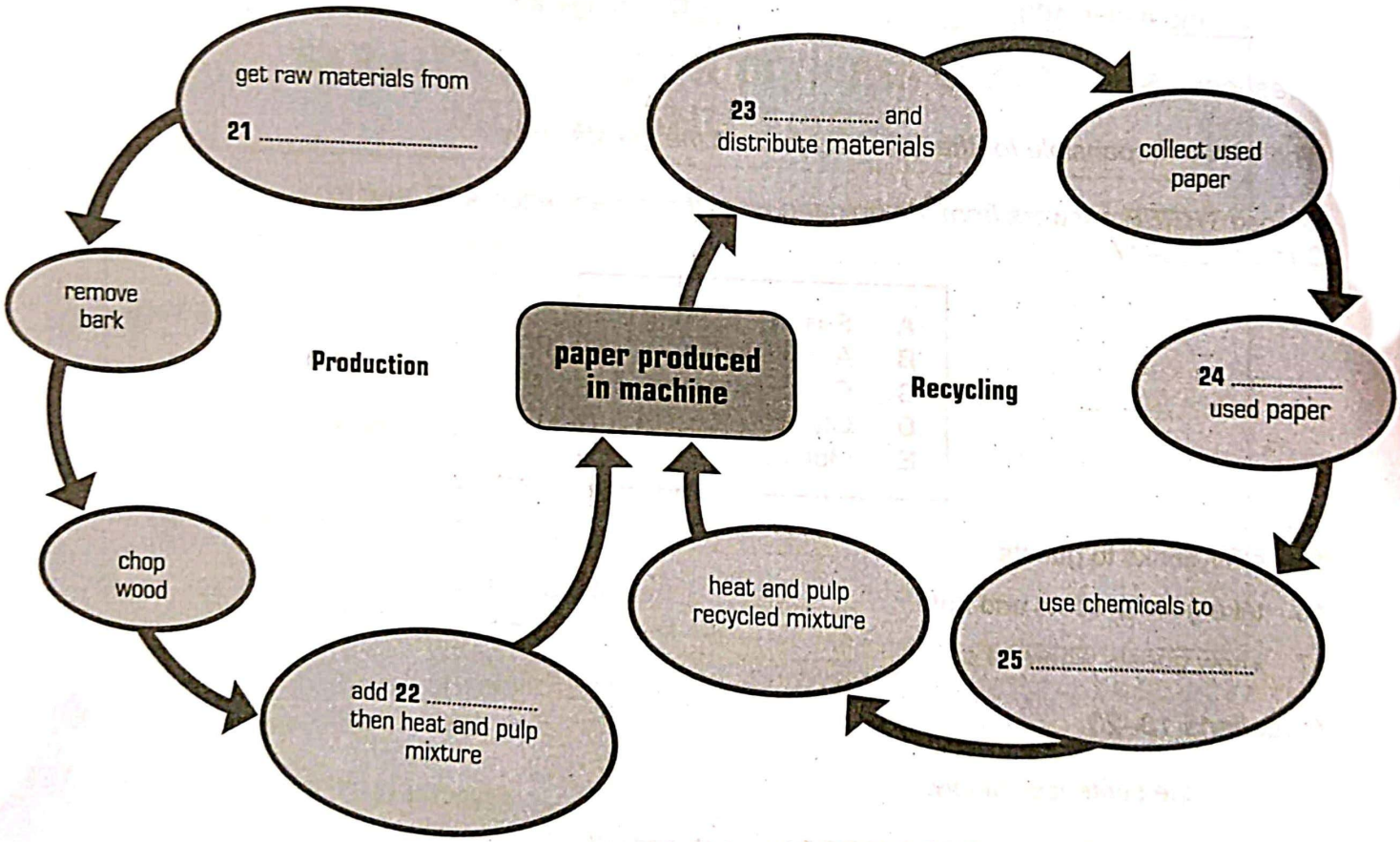
PART 3 *Questions 21–30*

Questions 21–25

Complete the flow-chart below.

Write ***NO MORE THAN TWO WORDS*** *for each answer.*

Paper Production and Recycling



Questions 26–30

Answer the questions below.

Write ***NO MORE THAN TWO WORDS*** *for each answer.*

26 What part of the assignment is Alan going to start working on? .....

27 Where will Melanie get more information on used paper collection? .....

28 What will they add to the assignment to make it more interesting? .....

29 What do they agree to complete by the end of the month? .....

30 Who will they ask to review their work? .....

PART 4 *Questions 31–40*

Questions 31–38

Complete the notes below.

*Write **ONE WORD AND/OR A NUMBER** for each answer.*

HAIR

Facts about hair

- main purposes – warmth and **31** .....
- main component *keratin* – makes fingernails **32** .....
- full head of hair can support a large weight – equal to two **33** .....
- average number of strands of hair – **34** ..... for an adult
- large amount of money spent on **35** ..... for hair in the UK

Structure of hair

Three main parts:

a) bulb – like a **36** ..... over end of hair follicle

b) root – contains glands that supply **37** ..... to hair strand

c) shaft – not **38** .....

Questions 39–40

Complete the summary below.

*Write **ONE WORD ONLY** for each answer.*

Health and Hair

Changes in diet will take longer to affect your hair than your **39** ..... .
Vitamins C, D and E are all important for healthy hair and **40** .....
are one of the best sources of Vitamin C.

READING

READING PASSAGE 1

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

SECRETS OF THE SWARM

Insects, birds and fish tend to be the creatures that humans feel furthest from. Unlike many mammals they do not engage in human-like behaviour. The way they swarm or flock together does not usually get good press coverage either: marching like worker ants might be a common simile for city commuters, but it's a damning, not positive, image. Yet a new school of scientific theory suggests that these swarms might have a lot to teach us.

American author Peter Miller explains, 'I used to think that individual ants knew where they were going, and what they were supposed to do when they got there. But Deborah Gordon, a biologist at Stanford University, showed me that nothing an ant does makes any sense except in terms of the whole colony. Which makes you wonder if, as individuals, we don't serve a similar function for the companies where we work or the communities where we live.' Ants are not intelligent by themselves. Yet as a colony, they make wise decisions. And as Gordon discovered during her research, there's no one ant making decisions or giving orders.

Take food collecting, for example. No ant decides, 'There's lots of food around today; lots of ants should go out to collect it.' Instead, some forager ants go out, and as soon as they find food, they pick it up and come back to the nest. At the entrance, they brush past reserve foragers, sending a 'go out' signal. The faster the foragers come back, the more food there is and the faster other foragers go out, until gradually the amount of food being brought back diminishes. An organic calculation has been made to answer the question, 'How many foragers does the colony need today?' And if something goes wrong – a hungry lizard prowling around for an ant snack, for instance – then a rush of ants returning without food sends waiting reserves a 'Don't go out' signal.

But could such decentralised control work in a human organisation? Miller visited a Texas gas company that has successfully applied formulas based on ant colony behaviour to 'optimise its factories and route its trucks'. He explains, 'If ant colonies had worked out a reliable way to identify the best routes between their nest and food sources, the company managers figured, why not take advantage of that knowledge?' So they came up with a computer model, based on the self-organising principles of an ant colony. Data is fed into the model about deliveries needing to be made the next day, as well as things like weather conditions, and it produces a simulation determining the best route for the delivery lorries to take.

Miller explains that he first really understood the impact that swarm behaviour could have on humans when he read a study of honeybees by Tom Seeley, a biologist at Cornell University. The honeybees choose as a group which new nest to move to. First, scouts fly off to investigate multiple sites. When they return they do a 'waggle dance' for their spot, and other scouts will then fly off and investigate it. Many bees go out, but none tries to compare all sites. Each reports back on just one. The more they liked their nest, the more vigorous and

lengthy their waggle dance and the more bees will choose to visit it. Gradually the volume of bees builds up towards one site; it's a system that ensures that support for the best site snowballs and the decision is made in the most democratic way.

Humans, too, can make clever decisions through diversity of knowledge and a little friendly competition. 'The best example of shared decision-making that I witnessed during my research was a town meeting I attended in Vermont, where citizens met face-to-face to debate their annual budget,' explains Miller. 'For group decision-making to work well, you need a way to sort through the various options they propose; and you need a mechanism to narrow down these options.' Citizens in Vermont control their municipal affairs by putting forward proposals, or backing up others' suggestions, until a consensus is reached through a vote. As with the bees, the broad sampling of options before a decision is made will usually result in a compromise acceptable to all. The 'wisdom of the crowd' makes clever decisions for the good of the group – and leaves citizens feeling represented and respected.

The Internet is also an area where we are increasingly exhibiting swarm behaviour, without any physical contact. Miller compares a wiki website, for example, to a termite mound. Indirect collaboration is the key principle behind information-sharing web sites, just as it underlies the complex constructions that termites build. Termites do not have an architect's blueprint or a grand construction scheme. They simply sense changes in their environment, as for example when the mound's wall has been damaged, altering the circulation of air. They go to the site of the change and drop a grain of soil. When the next termite finds that grain, they drop theirs too. Slowly, without any kind of direct decision-making, a new wall is built. A termite mound, in this way, is rather like a wiki website. Rather than meeting up and talking about what we want to post online, we just add to what someone – maybe a stranger on the other side of the world – already wrote. This indirect knowledge and skill-sharing is now finding its way into the corridors of power.

Questions 1–6

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

In boxes 1–6 on your answer sheet, write

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

1 Commuters are often compared favourably with worker ants.

2 Some ants within a colony have leadership roles.

3 Forager ants tell each other how far away the food source is.

4 Forager ants are able to react quickly to a dangerous situation.

5 Termite mounds can be damaged by the wind.

6 Termites repair their mounds without directly communicating with each other.

Questions 7–9

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

*Write the correct letter, **A–F**, in boxes 7–9 on your answer sheet.*

7 Managers working for a Texas gas company

8 Citizens in an annual Vermont meeting

9 Some Internet users

A provide support for each other's ideas in order to reach the best outcome.

B use detailed comments to create large and complicated systems.

C use decision-making strategies based on insect communities to improve their service.

D communicate with each other to decide who the leader will be.

E contribute independently to the ideas of others they do not know.

F repair structures they have built without directly communicating with each other.

Questions 10–13

Complete the flow-chart below.

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

Write your answers in boxes 10–13 on your answer sheet.

How honeybees choose a new nest

Honeybee **10** ..... explore possible nest sites

↓

they perform what is known as a **11** ..... on their return

↓

other bees go out and report back

↓

enthusiasm and **12** ..... increase for one particular site

↓

a final choice is reached using a **13** ..... process

READING PASSAGE 2

You should spend about 20 minutes on ***Questions 14–26****, which are based on Reading Passage 2 on the following pages.*

Questions 14–18

The text on the following pages has five paragraphs, **A–E**.

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

Write the correct number, ***i–viii****, in boxes 14–18 on your answer sheet.*

List of Headings

- **i** A joint business project
- **ii** Other engineering achievements
- **iii** Examining the overall benefits
- **iv** A building like no other
- **v** Some benefits of traditional methods
- **vi** A change of direction
- **vii** Examples of similar global brands
- **viii** From factory to building site

14 Paragraph A

15 Paragraph B

16 Paragraph C

17 Paragraph D

18 Paragraph E

High Speed, High Rise

A Chinese entrepreneur has figured out a way to manufacture 30-story, earthquake-proof skyscrapers that snap together in just 15 days.

A Zhang Yue is founder and chairman of Broad Sustainable Building (otherwise known as 'Broad') who, on 1 January, 2012, released a time-lapse video of its 30-story achievement. It shows construction workers buzzing around like gnats while a clock in the corner of the screen marks the time. In just 360 hours, a 100-metre-tall tower called the T30 rises from an empty site to overlook Hunan's Xiang River. At the end of the video, the camera spirals around the building overhead as the Broad logo appears on the screen: a lowercase b that wraps around itself in an imitation of the @ symbol. The company is in the process of franchising its technology to partners in India, Brazil, and Russia. What it is selling is the world's first standardized skyscraper and with it, Zhang aims to turn Broad into the McDonald's of the sustainable building industry. When asked why he decided to start a construction company, Zhang replies, 'It's not a construction company. It's a structural revolution.'

B So far, Broad has built 16 structures in China, plus another in Cancun. They are fabricated at two factories in Hunan, roughly an hour's drive from Broad Town, the sprawling headquarters. The floors and ceilings of the skyscrapers are built in sections, each measuring 15.6 by 3.9 meters with a depth of 45 centimeters. Pipes and ducts for electricity, water and waste are threaded through each floor module while it is still in the factory. The client's choice of flooring is also pre-installed on top. Standardized truckloads carry two modules each to the site with the necessary columns, bolts and tools to connect them stacked on top of each other. Once they arrive at the location, each section is lifted by crane directly to the top of the building, which is assembled like toy Lego bricks. Workers use the materials on the module to quickly connect the pipes and wires. The unique column design has diagonal bracing at each end and tabs that bolt into the floors above and below. In the final step, heavily insulated exterior walls and windows are slotted in by crane. The result is far from pretty but the method is surprisingly safe – and phenomenally fast.

C Zhang attributes his success to his creativity and to his outsider perspective on technology. He started out as an art student in the 1980s, but in 1988, Zhang left the art world to found Broad. The company started out as a maker of non-pressurized boilers. His senior vice-president, Juliet Jiang, says, 'He made his fortune on boilers. He could have kept doing this business, but … he saw the need for nonelectric air-conditioning.' Towards the end of the decade, China's economy was expanding past the capacity of the nation's electricity grid, she explains. Power shortages were becoming a serious obstacle to growth. Large air-conditioning (AC) units fueled by natural gas could help companies ease their electricity load, reduce overheads, and enjoy more reliable climate control into the bargain. Today, Broad has units operating in more than 70 countries, in some of the largest buildings and airports on the planet.

D For two decades, Zhang's AC business boomed. But a couple of events conspired to change his course. The first was that Zhang became an environmentalist. The second was the earthquake that hit China's Sichuan Province in 2008, causing the collapse of poorly constructed buildings. Initially, he says, he tried to convince developers to refit existing buildings to make them both more stable and more sustainable, but he had little success. So Zhang drafted his own engineers and started researching how to build cheap, environmentally friendly structures that could also withstand an earthquake. Within six months of starting his research, Zhang had given up on traditional methods. He was frustrated by the cost of hiring designers and specialists for each new structure. The best way to cut costs, he decided, was to take building to the factory. But to create a factory-built skyscraper, Broad had to abandon the principles by which skyscrapers are typically designed. The whole load-bearing structure had to be different. To reduce the overall weight of the building, it used less concrete in the floors; that in turn enabled it to cut down on structural steel.

E Around the world, prefabricated and modular buildings are gaining in popularity. But modular and prefabricated buildings elsewhere are, for the most part, low-rise. Broad is alone in applying these methods to skyscrapers. For Zhang, the environmental savings alone justify the effort. According to Broad's numbers, a traditional high-rise will produce about 3,000 tons of construction waste, while a Broad building will produce only 25 tons. Traditional buildings also require 5,000 tons of water onsite to build, while Broad buildings use none. The building process is also less dangerous. Elevator systems – the base, rails, and machine room – can be installed at the factory, eliminating the risk of injury. And instead of shipping an elevator car to the site in pieces, Broad orders a finished car and drops it into the shaft by crane. In the future, elevator manufacturers are hoping to preinstall the doors, completely eliminating any chance that a worker might fall. 'Traditional construction is chaotic,' he says. 'We took construction and moved it into the factory.' According to Zhang, his buildings will help solve the many problems of the construction industry and what's more, they will be quicker and cheaper to build.

Questions 19–22

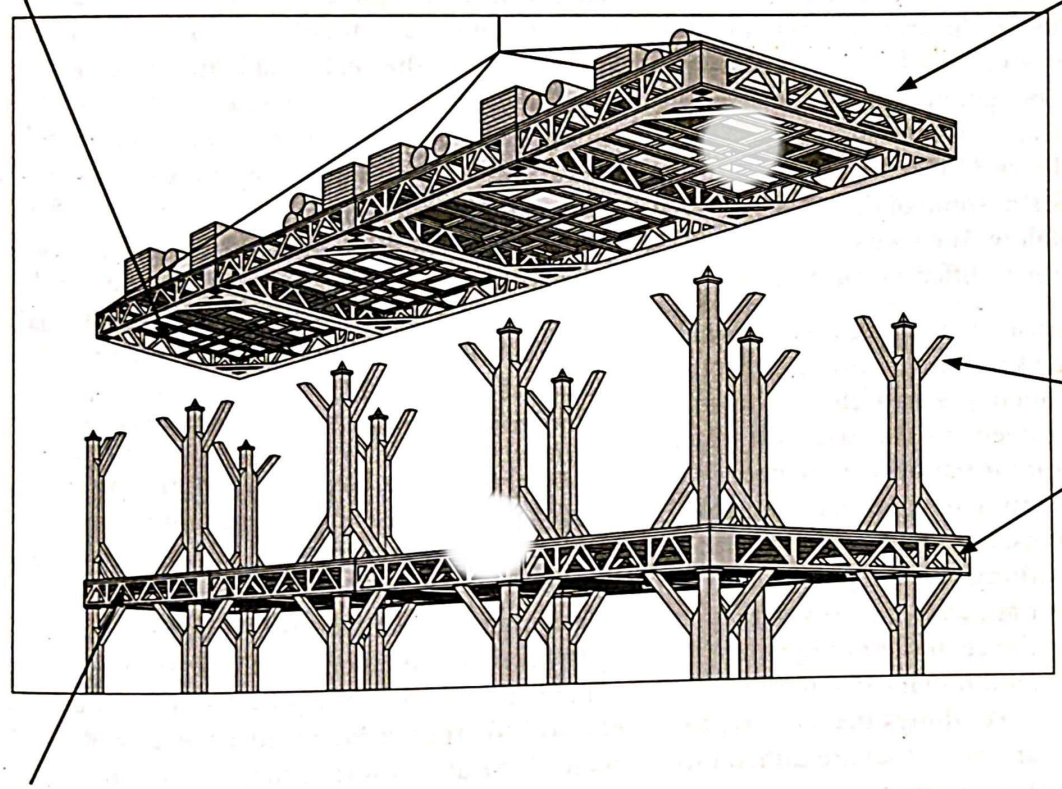
Label the diagram below.

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

Write your answers in boxes 19–22 on your answer sheet.

pipes and ducts installed while in **19** .....

section contains less **22** ..... than conventional buildings



diagonal bracing at top and bottom of **21** .....

20 ..... chosen by customer

Questions 23–26

Complete the sentences below.

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

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

23 Zhang refers to his business as a ..... .

24 The first products Broad manufactured were ..... .

25 In the late eighties, ... were holding back industrial progress in China.

26 In addition to power and cost benefits, Broad's AC units improve ..... .

READING PASSAGE 3

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

When conversations flow

We spend a large part of our daily life talking with other people and, consequently, we are very accustomed to the art of conversing. But why do we feel comfortable in conversations that have flow, but get nervous and distressed when a conversation is interrupted by unexpected silences? To answer this question we will first look at some of the effects of conversational flow. Then we will explain how flow can serve different social needs.

The positive consequences of conversational flow show some similarities with the effects of 'processing fluency'. Research has shown that processing fluency – the ease with which people process information – influences people's judgments across a broad range of social dimensions. For instance, people feel that when something is easily processed, it is more true or accurate. Moreover, they have more confidence in their judgments regarding information that came to them fluently, and they like things that are easy to process more than things that are difficult to process. Research indicates that a speaker is judged to be more knowledgeable when they answer questions instantly; responding with disfluent speech markers such as 'uh' or 'um' or simply remaining silent for a moment too long can destroy that positive image.

One of the social needs addressed by conversational flow is the human need for 'synchrony' – to be 'in sync' or in harmony with one another. Many studies have shown how people attempt to synchronize with their partners, by coordinating their behavior. This interpersonal coordination underlies a wide array of human activities, ranging from more complicated ones like ballroom dancing to simply walking or talking with friends.

In conversations, interpersonal coordination is found when people adjust the duration of their utterances and their speech rate to one another so that they can enable turn-taking to occur, without talking over each other or experiencing awkward silences. Since people are very well-trained in having conversations, they are often able to take turns within milliseconds, resulting in a conversational flow of smoothly meshed behaviors. A lack of flow is characterized by interruptions, simultaneous speech or mutual silences. Avoiding these features is important for defining and maintaining interpersonal relationships.

The need to belong has been identified as one of the most basic of human motivations and plays a role in many human behaviors. That conversational flow is related to belonging may be most easily illustrated by the consequences of flow disruptions. What happens when the positive experience of flow is disrupted by, for instance, a brief silence? We all know that silences can be pretty awkward, and research shows that even short disruptions in conversational flow can lead to a sharp rise in distress levels. In movies, silences are often used to signal non-compliance or confrontation (Piazza, 2006). Some researchers even argue that 'silencing someone' is one of the most serious forms of exclusion. Group membership is of elementary importance to our wellbeing and because humans are very sensitive to signals of exclusion, a silence is generally taken as a sign of rejection. In this way, a lack of flow in a conversation may signal that our relationship is not as solid as we thought it was.

Another aspect of synchrony is that people often try to validate their opinions to those

of others. That is, people like to see others as having similar ideas or worldviews as they have themselves, because this informs people that they are correct and their worldviews are justified. One way in which people can justify their worldviews is by assuming that, as long as their conversations run smoothly, their interaction partners probably agree with them. This idea was tested by researchers using video observations. Participants imagined being one out of three people in a video clip who had either a fluent conversation or a conversation in which flow was disrupted by a brief silence. Except for the silence, the videos were identical. After watching the video, participants were asked to what extent the people in the video agreed with each other. Participants who watched the fluent conversation rated agreement to be higher than participants watching the conversation that was disrupted by a silence, even though participants were not consciously aware of the disruption. It appears that the subjective feeling of being out of sync informs people of possible disagreements, regardless of the content of the conversation.

Because people are generally so well-trained in having smooth conversations, any disruption of this flow indicates that something is wrong, either interpersonally or within the group as a whole. Consequently, people who do not talk very easily may be incorrectly understood as being less agreeable than those who have no difficulty keeping up a conversation. On a societal level, one could even imagine that a lack of conversational flow may hamper the integration of immigrants who have not completely mastered the language of their new country yet. In a similar sense, the ever-increasing number of online conversations may be disrupted by misinterpretations and anxiety that are produced by insuperable delays in the Internet connection. Keeping in mind the effects of conversational flow for feelings of belonging and validation may help one to be prepared to avoid such misunderstandings in future conversations.

Questions 27–32

Do the following statements agree with the claims of the writer in the text?

In boxes 27–32 on your answer sheet, write

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

27 Conversation occupies much of our time.

28 People assess information according to how readily they can understand it.

29 A quick response to a question is thought to show a lack of knowledge.

30 Video observations have often been used to assess conversational flow.

31 People who talk less often have clearer ideas than those who talk a lot.

32 Delays in online chat fail to have the same negative effect as disruptions that occur in natural conversation.

Questions 33–40

Complete the summary below.

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

Write your answers in boxes 33–40 on your answer sheet.

Synchrony

There is a human desire to co-ordinate **33** ..... in an effort to be 'in harmony'. This co-ordination can be seen in conversations when speakers alter the speed and extent of their speech in order to facilitate **34** ..... . This is often achieved within milliseconds: only tiny pauses take place when a conversation flows; when it doesn't, there are **35** ..... and silences, or people talk at the same time.

Our desire to **36** ..... is also an important element of conversation flow. According to research, our **37** ..... increase even if silences are brief. Humans have a basic need to be part of a group, and they experience a sense of **38** ..... if silences exclude them.

People also attempt to co-ordinate their opinions in conversation. In an experiment, participants' judgement of the overall **39** ..... among speakers was tested using videos of a fluent and a slightly disrupted conversation. The results showed that the **40** ..... of the speakers' discussion was less important than the perceived synchrony of the speakers.

Test 4

LISTENING

PART 1 *Questions 1–10*

Questions 1–6

Complete the table below.

*Write **NO MORE THAN ONE WORD AND/OR A NUMBER** for each answer.*

Community Centre Evening Classes

Class	Where	When	What to bring	Cost
Painting with watercolours	*Example* in the hall	at **1** ..... pm on Tuesdays	water jar and set of **2**	$45 – four classes
Maori language	the small room at the **3** ..... of the building	starts in **4**	small recorder	$40 – five classes
Digital photography	room 9	6 pm Wednesday evenings	the **5** ..... for the camera	**6** $..... – eight classes

Questions 7–10

Complete the sentences below.

*Write **ONE WORD ONLY** for each answer.*

7 The watercolours class suits people who are ..... .

8 To find out about the Maori language class, contact Jason ..... .

9 For the photography class, check the ..... for the camera.

10 There is a trip to a local ..... in the final week of the photography class.

PART 2 *Questions 11–20*

Questions 11 and 12

*Choose **TWO** letters, **A–E**.*

*Which **TWO** tasks will the volunteers in Group A be responsible for?*

A widening pathways

B planting trees

C picking up rubbish

D putting up signs

E building fences

Questions 13 and 14

*Choose **TWO** letters, **A–E**.*

*Which **TWO** items should volunteers in Group A bring with them?*

A food and water

B boots

C gloves

D raincoats

E their own tools

Questions 15–20

Label the plan below.

Write the correct letter, ***A–I****, next to Questions 15–20.*

15 Vegetable beds .....

16 Bee hives .....

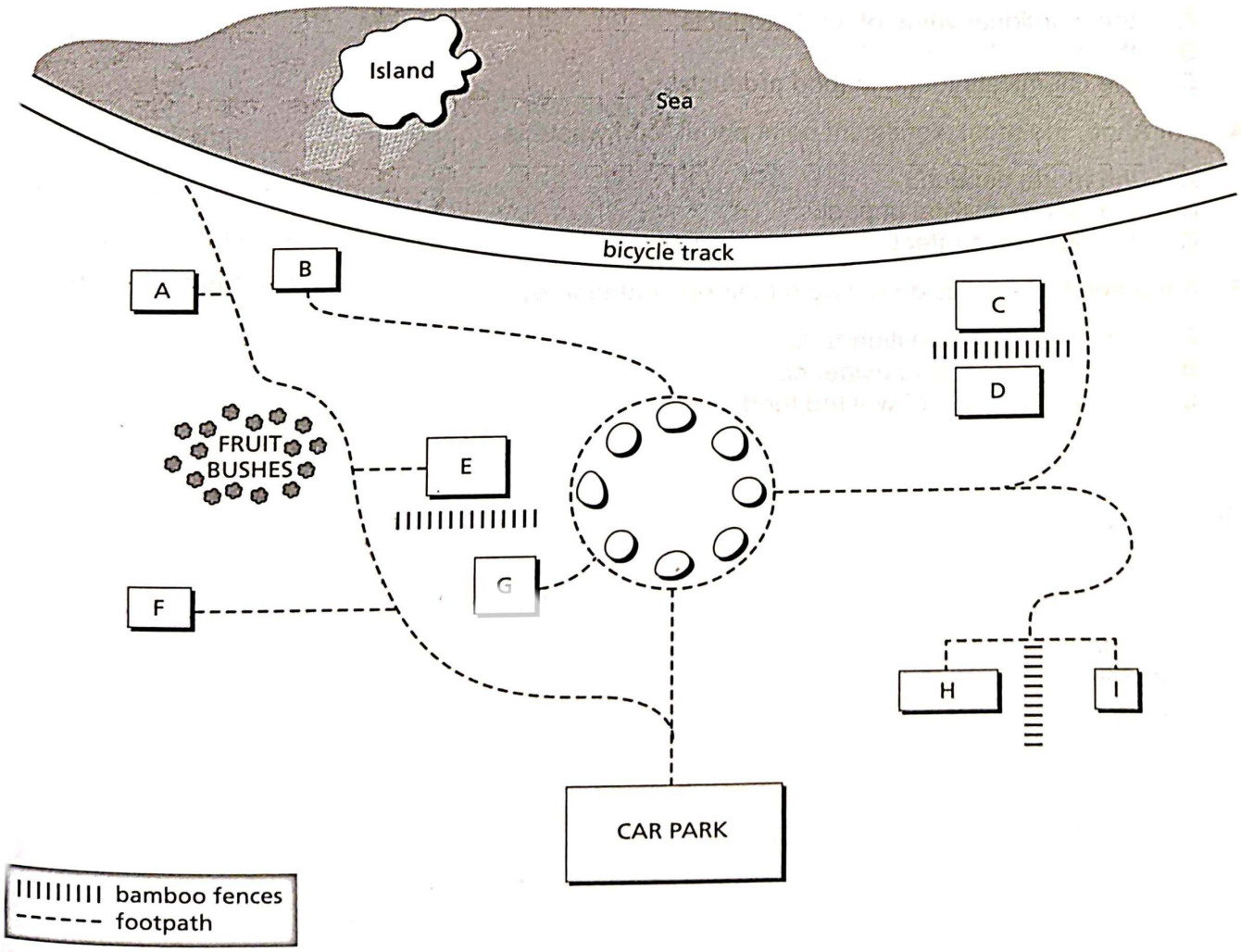
17 Seating .....

18 Adventure playground .....

19 Sand area .....

20 Pond .....

Hadley Park Community Gardens Project



PART 3 *Questions 21–30*

Questions 21–25

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

Food Waste

21 What point does Robert make about the 2013 study in Britain?

A It focused more on packaging than wasted food.
B It proved that households produced more waste than restaurants.
C It included liquid waste as well as solid waste.

22 The speakers agree that food waste reports should emphasise the connection between carbon dioxide emissions and

A food production.
B transport of food to landfill sites.
C distribution of food products.

23 Television programmes now tend to focus on

A the nutritional value of food products.
B the origin of food products.
C the chemicals found in food products.

24 For Anna, the most significant point about food waste is

A the moral aspect.
B the environmental impact.
C the economic effect.

25 Anna and Robert decide to begin their presentation by

A handing out a questionnaire.
B providing statistical evidence.
C showing images of wasted food.

Questions 26–30

What advantage do the speakers identify for each of the following projects?

*Choose **FIVE** answers from the box and write the correct letter, **A–G**, next to Questions 26–30.*

Advantages

A It should save time.

B It will create new jobs.

C It will benefit local communities.

D It will make money.

E It will encourage personal responsibility.

F It will be easy to advertise.

G It will involve very little cost.

Projects

26 edible patch .....

27 ripeness sensor .....

28 waste tracking technology .....

29 smartphone application .....

30 food waste composting .....

PART 4 *Questions 31–40*

Complete the notes below.

Write ***ONE WORD*** *for each answer.*

Kite-making by the Maori people of New Zealand

Making and appearance of the kites

- The priests who made the kites had rules for size and scale
- **31** ..... was not allowed during a kite's preparation

Kites:

- often represented a bird, a god, or a **32** ..... .
- had frames that were decorated with grasses and **33** ..... .
- had a line of noisy **34** ..... attached to them.
- could be triangular, rectangular or **35** ..... shaped.
- had patterns made from clay mixed with **36** ..... oil.
- sometimes had human-head masks with **37** ..... and a tattoo.

Purpose and function of kites:

- a way of sending **38** ..... to the gods
- a way of telling other villages that a **39** ..... was necessary
- a means of **40** ..... if enemies were coming.

READING

READING PASSAGE 1

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

South Pole Adventurer

In the race to the South Pole, there was a Japanese team attempting to be first, led by heroic explorer Nobu Shirase

FOR a few weeks in January 1912, Antarctica was full of explorers. Norwegian Roald Amundsen had reached the South Pole on 14 December and was speeding back to the coast. On 17 January, Robert Scott and the men of the British Antarctic expedition had arrived at the pole to find they had been beaten to it. Just then, a third man arrived; Japanese explorer Nobu Shirase. However, his part in one of the greatest adventure stories of the 20th century is hardly known outside his own country, even by fellow explorers. Yet as Scott was nearing the pole and with the rest of the world still unaware of Amundsen's triumph, Shirase and his team sailed into Antarctica's Bay of Whales in the smallest ship ever to try its luck in these dangerous waters.

Since boyhood Shirase had dreamed of becoming a polar explorer. Like Amundsen, he initially set his sights on the North Pole. But after the American Robert Peary claimed to have reached it in 1909, both men hastily altered their plans. Instead they would aim for the last big prize: the South Pole. In January 1910, Shirase put his plans before Japanese government officials, promising to raise the flag at the South Pole within three years. For many of them, the question wasn't could he do it but why would it be worth doing? 15 years earlier the International Geographical Congress had said that as the last unknown continent the Antarctic offered the chance to add to knowledge in almost every branch of science. So, like the British, Shirase presented his expedition as a search for knowledge: he would bring back fossils, make meteorological measurements and explore unknown parts of the continent.

The response from the government was cool, however, and Shirase struggled to raise funds. Fortunately, a few months later, Japan's former prime minister Shigenobu Okuma came to Shirase's rescue. With Okuma's backing, Shirase got together just enough money to buy and equip a small ship. He eventually acquired a scientist, too, called Terutaro Takeda. At the end of November 1910, his ship the *Kainan Maru* finally left Tokyo with 27 men and 28 Siberian dogs on board. Before leaving, Shirase confidently outlined his plans to the media. He would sail to New Zealand, then reach Antarctica in February, during the southern summer, and then proceed to the pole the following spring. This was not to be, however. Bad weather delayed the expedition and they didn't reach New Zealand until 8 February; Amundsen and Scott had already been in Antarctica for a month, preparing for winter.

In New Zealand local reporters were astonished: the ship was half the size of Amundsen's ship. True, it was reinforced with iron plate and extra wood, but the ship had only the feeblest engine to help force its way through ice. Few doubted Shirase's courage, but most reckoned the expedition to be ill-prepared as the Japanese had only lightweight sledges for transport across the ice, made of bamboo and wood.

But Shirase's biggest challenge was time. Antarctica is only accessible by sea for a few weeks in summer and expeditions usually aimed to arrive in January or February. 'Even with their determination and daring, our Japanese friends are running it rather fine,' wrote local reporters. Nevertheless, on 11 February the *Kainan Maru* left New Zealand and sailed straight into the worst weather the captain had ever seen. Then, on 6 March, they approached the coastline of Antarctica's Ross Sea, looking for a place to land. The ice began to close in, threatening to trap them for the winter, an experience no one was likely to survive. With a remarkable piece of seamanship, the captain steered the ship out of the ice and turned north. They would have to wait out the winter in a warmer climate.

A year later than planned, Shirase and six men finally reached Antarctica. Catching up with Scott or Amundsen was out of the question and he had said he would stick to science this time. Yet Shirase still felt the pull of the pole and eventually decided he would head southward to experience the thrills and hardships of polar exploration he had always dreamed of. With provisions for 20 days, he and four men would see how far they could get.

Shirase set off on 20 January 1912 with Takeda and two dog handlers, leaving two men at the edge of the ice shelf to make meteorological measurements. For a week they struggled through one blizzard after another, holing up in their tents during the worst of the weather. The temperature fell to –25°C, and frostbite claimed some of the dogs. On 26 January, Shirase estimated there were enough provisions to continue for two more days. Two days later, he announced it was time to turn back. Takeda calculated they had reached 80° 5 south and had travelled 250 kilometres. The men hoisted the Japanese flag.

On 3 February, all the men were heading home. The ship reached Tokyo in June 1912 - and Shirase was greeted like a hero despite the fact that he never reached the pole. Nor did he contribute much to science - but then nor did Amundsen, whose only interest was in being first to the pole. Yet Shirase's expedition was heroic. They travelled beyond 80° south, one of only four teams to have gone so far south at the time. Furthermore, they did it all without the advantages of the other teams and with no previous experience.

Questions 1–8

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

In boxes 1–8 on your answer sheet, write

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

1 Shirase's trip to the South Pole is well-known to other explorers.

2 Since Shirase arrived in Antarctica, smaller ships have also made the journey.

3 Shirase's original ambition was to travel to the North Pole.

4 Some Japanese officials thought Shirase's intention to travel to the South Pole was pointless.

5 The British team announced their decision to carry out scientific research in Antarctica before Shirase.

6 Shirase found it easy to raise the money he needed for his trip to the South Pole.

7 A previous prime minister of Japan persuaded a scientist to go with Shirase.

8 The weather that slowed down Shirase's progress to New Zealand was unusually bad for the season.

Questions 9–13

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

Write your answers in boxes 9–13 on your answer sheet.

9 When reporters in New Zealand met Shirase, they were
- **A** concerned about the quality of his equipment.
- **B** impressed with the design of his ship.
- **C** certain he was unaware of the dangers ahead.
- **D** surprised by the bravery he demonstrated.

10 What are we told about the captain of the *Kainan Maru* in the fifth paragraph?
- **A** He had given Shirase some poor advice.
- **B** His skill at sailing saved the boat and crew.
- **C** He refused to listen to the warnings of others.
- **D** He was originally confident they could reach Antarctica.

11 After Shirase finally reached Antarctica he realised that
- **A** he was unsure of the direction he should follow.
- **B** he would have to give up on fulfilling his personal ambition.
- **C** he might not have enough food to get to the South Pole.
- **D** he still wanted to compete in the race against the other teams.

12 What is the writer doing in the seventh paragraph?
- **A** criticising a decision concerning scientific research.
- **B** explaining why a particular mistake had occurred.
- **C** describing the conditions that the expedition faced.
- **D** rejecting the idea that Shirase was poorly prepared.

13 What is the writer's main point in the final paragraph?
- **A** Considering the problems Shirase had to deal with, his achievement was incredible.
- **B** In Japan, the reaction to Shirase's adventure in Antarctica came as a surprise to him.
- **C** It was obvious that Amundsen would receive more attention as an explorer than Shirase.
- **D** Shirase had achieved more on the Antarctic expedition than even he had expected.

READING PASSAGE 2

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

The rise of the agribots

The use of robots and automation in the farming industry

The next time you stand at the supermarket checkout, spare a thought for the farmers who helped fill your shopping basket as life is hard for them right now. This, in turn, inevitably means bigger grocery bills for consumers, and greater hardship for the millions in countries where food shortages are a matter of life and death. Worse, studies suggest that the world will need twice as much food by 2050. Yet while farmers must squeeze more out of the land, they must also address the necessity of reducing their impact on the soil, waterways and atmosphere. All this means rethinking how agriculture is practiced, and taking automation to a whole new level. On the new model farms of the future, precision will be key. Why dose a whole field with chemicals if you can spray only where they are needed? Each plant could get exactly the right amount of everything, no more or less, an approach that could slash chemical use and improve yields in one move. But this is easier said than done; the largest farms in Europe and the U.S. can cover thousands of acres. That's why automation is key to precision farming. Specifically, say agricultural engineers, precision farming needs robot farmers.

One day, we might see fields with 'agribots' (agricultural robots) that can identify individual seedlings and encourage them along with drops of fertilizer. Other machines would distinguish problem weeds from crops and eliminate them with shots from high-power lasers or a microdot of pesticide. These machines will also be able to identify and harvest all kinds of vegetables. More than a century of mechanization has already turned farming into an industrial-scale activity in much of the world, with farms that grow cereals being the most heavily automated. But a variety of other crops, including oranges and tomatoes destined to become processed foods, are also picked mechanically, albeit to a slightly lesser extent. Yet the next wave of autonomous farm machinery is already at work. You probably haven't even noticed, for these robots are disguised as tractors. Many are self-steering, use GPS to cross a field, and can even 'talk' to their implements – a plough or sprayer, for example. And the implements can talk back, telling the tractor that it's going too fast or needs to move to the left. This kind of communication is also being developed in other farm vehicles. A new system allows a combine harvester, say, to send a call over to a tractor-trailer so the driver can unload the grain as and when necessary.

However, when fully autonomous systems take to the field, they'll look nothing like tractors. With their enormous size and weight, today's farm machines have significant downsides: they compact the soil, reducing porosity and killing beneficial life, meaning crops don't grow so well. Simon Blackmore, who researches agricultural technology at Harper Adams University College in England believes that fleets of lightweight autonomous robots have the potential to solve this problem and that replacing brute force with precision is key. 'A seed only needs one cubic centimeter of soil to grow. If we cultivate just that we only put tiny amounts of energy in and the plants still grow nicely.' There is another reason why automation may be the way forward according to Eldert van Henten, a robotics researcher at Wageningen University in the Netherlands. 'While the population is growing and needs to be fed, a rapidly shrinking number of people are willing

to work in agriculture,' he points out. Other researchers such as Linda Calvin, an economist at the U.S. Department of Agriculture, and Philip Martin at the University of California, Davis, have studied trends in mechanization to predict how US farms might fare. Calvin and Martin have observed how rising employment costs have led to the adoption of labour-saving farm technology in the past, citing the raisin industry as an example. In 2000, a bumper harvest crashed prices and, with profits squeezed, farmers looked for a solution. With labour one of their biggest costs – 42 percent of production expenses on U.S. farms, on average – they started using a mechanical harvester adapted from a machine used by wine makers. By 2007, almost half of California's raisins were mechanically harvested and a labour force once numbering 50,000 had shrunk to 30,000.

As well as having an impact on the job market, the widespread adoption of agribots might bring changes at the supermarket. Lewis Holloway, who studies agriculture at the University of Hull, UK, says that robotic milking is likely to influence the genetics of dairy herds as farmers opt for 'robot-friendly' cows, with udder shape, and even attitudes, suited to automated milking. Similarly, he says, it's conceivable that agribots could influence what fruit or vegetable varieties get to the shops, since farmers may prefer to grow those with, say, leaf shapes that are easier for their robots to discriminate from weeds. Almost inevitably, these machines will eventually alter the landscape, too. The real tipping point for robot agriculture will come when farms are being designed with agribots in mind, says Salah Sukkarieh, a robotics researcher at the Australian Center for Field Robotics, Sydney. This could mean a return to smaller fields, with crops planted in grids rather than rows and fruit trees pruned into two-dimensional shapes to make harvesting easier. This alien terrain tended by robots is still a while away, he says 'but it will happen.'

Questions 14–17

Do the following statements agree with the claims of the writer in Reading Passage 2?

In boxes 14–17 on your answer sheet, write

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

14 Governments should do more to ensure that food is generally affordable.

15 Farmers need to reduce the harm they do to the environment.

16 In the future, farmers are likely to increase their dependency on chemicals.

17 Farms in Europe and the US may find it hard to adapt to precision farming.

Questions 18–21

Complete the sentences below.

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

Write your answers in boxes 18–21 on your answer sheet.

18 In the future, agribots will provide ..... to young plants.

19 Some machines will use chemicals or ..... to get rid of unwanted plants.

20 It is the production of ..... which currently uses most machinery on farms.

21 ..... between machines such as tractors is making farming more efficient.

Questions 22–26

Look at the following researchers (Questions 22–26) and the list of statements below.

*Match each researcher with the correct statement, **A–H**.*

*Write the correct letter, **A–H**, in boxes 22–26 on your answer sheet.*

22 Simon Blackmore

23 Eldert van Henten

24 Linda Calvin and Philip Martin

25 Lewis Holloway

26 Salah Sukkarieh

List of Findings

A The use of automation might impact on the development of particular animal and plant species.

B We need to consider the effect on employment that increased automation will have.

C We need machines of the future to be exact, not more powerful.

D As farming becomes more automated the appearance of farmland will change.

E New machinery may require more investment than certain farmers can afford.

F There is a shortage of employees in the farming industry.

G There are limits to the environmental benefits of automation.

H Economic factors are often the driving force behind the development of machinery.

READING PASSAGE 3

*You should spend about 20 minutes on **Questions 27–43**, which are based on Reading Passage 3 below.*

The Work of Caravaggio

A Every once in a while, a controversy takes the art world by storm. One such example is the case of a painting of a group of three men playing cards, which may or may not be by the Italian painter Caravaggio (1571 to 1610) and which has been at the centre of a case at the High Court in London. The painting was owned by one Mr Lancelot William Thwaytes, who, back in 2006, sold the painting through the London auction house Sotheby's for £42,000. The painting was bought on behalf of the art collector and Caravaggio expert Sir Denis Mahon. After carrying out extensive research into and restoration of the painting, Sir Denis announced that the painting was in fact an original Caravaggio. It has since been valued at £10 million. Mr Thwaytes proceeded to sue the auctioneers for professional negligence, arguing that they should have consulted more experts when assessing the painting, and advised him of its potential value. Had they done so, he insists, he could have sold the painting for millions.

B Authenticating a work of art is often difficult, especially when it is, as in this case, several hundred years old, and at least one tool for the expert, namely records of all prior owners, are limited or non-existent. In some cases, these records can be traced right back to the artist himself, but this is rare. Most judges, at least in the English-speaking world, are reluctant to rule on whether an artwork should or should not be attributed[1] to a particular artist, as this question lies outside their field of expertise.

C In civil legal cases, when a decision is challenged in court, a judge must decide if the experts are right or wrong. The standard of proof is 'more likely than not', or 'on the balance of probabilities'. And yet, in the art world, the degree of proof required is more similar to that needed in criminal trials, which require 'proof beyond all reasonable doubt'. No-one would pay full price for a painting that was more-likely-than-not, on-the-balance-of-probabilities, by the legendary artist Picasso.

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[1]attribute = to say or believe that an artwork is the work of a particular person

D An additional difficulty in attributing a work to a particular artist arises when the artist had a studio, where pupils may have been engaged to make copies of works by the master himself. This was the case with artists such as Guido Reni, but not with Caravaggio. Some artists are known to have made copies, or 'autograph replicas' of their own works. The majority of Caravaggio scholars are not of the opinion that Caravaggio himself painted copies of his own works. However, Sir Denis Mahon, the new owner, claimed that this was precisely what Caravaggio had done in this case, and that this was an autograph replica of the Caravaggio painting *The Cardsharps*[2], which is on display in the Kimbell Art Museum, in Fort Worth, Texas, USA, and depicts a very similar scene.

E Sotheby's contends that any resemblances between *The Cardsharps* and the painting it sold on behalf of Mr Thwaytes are insufficient to attribute the latter as genuine Caravaggio. It presented to the court a record of about 30 versions of the card game scene which had changed hands at auction, none of which were described as being by Caravaggio. An image of men cheating at cards was, they argued, popular subject matter at the time, and by no means unique to one artist.

F Unsurprisingly, auction houses such as Sotheby's go to great lengths not to misrepresent what is known about a painting's authorship when their catalogue. A set of phrases are employed to describe the degree of certainty as to the identity of the artist, such as 'Attributed to Giovanni Bellini', which means that the auctioneers consider that the work is probably by Bellini, but that they cannot be absolutely positive. 'Circle of Giovanni Bellini' would indicate that, in the considered opinion of Sotheby's experts, the work in question was produced by someone closely associated with Bellini, but almost certainly not by Bellini himself. 'After Giovanni Bellini' would mean that the work is considered to be a copy of a Bellini painting. In this case, Sotheby's attributed the work being sold by Mr Thwaytes to a 'follower' (and that does not necessarily mean someone who was a pupil) of Caravaggio.

G The court heard much discussion over the degree of artistic skill shown in the painting. The judge drew the conclusion that the quality was not up to that of the rest of the artist's known body of work, and as such ultimately ruled against Mr Thwaytes, who now faces substantial costs, but who still has the right to appeal, and may yet do so. While acknowledging many remarkable features of the picture, the judge instinctively felt that something was not quite right, and that Sotheby's were justified in being relauctant to label the painting a Caravaggio. She made a comparison with The Cardsharps, which is known to be a genuine Caravaggio and pointed out how a feather in that picture looked lifelike, soft and fluffy, whereas the one in the painting in question was far less convincing and three-dimensional.

H Mr Thwaytes's legal team also put forward the case that changes had been made to the picture. It can be seen that the artist had repainted a ribbon which hangs from the elbow of one of the card players, making it shorter than it had been before. This, they argued, would not have been necessary had someone simply been producing a duplicate from the original painting. Yet the judge did not accept that this suggested evidence of a creative mind at work rather than a copyist, or that this repainting should have alerted Sotheby's to any need to investigate further.

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[2]cardsharp = a person who cheats at card games

Questions 27–34

Reading Passage 3 has six paragraphs, **A–H**.

Which paragraph contains the following information?

*Write the correct letter, **A–H**, in boxes 27–32 on your answer sheet.*

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

27 accusations again Sotheby's

28 the result of Mr Thwaytes's court case

29 a widespread belief about Caravaggio's practice

30 an area in which legal professionals have limited knowledge

31 an explanation of the way a painting is credited to a certain artist affects its value.

32 language used to convey any doubts about who a painting is attributed to

33 whether conclusions can be drawn from changes which were made to Mr Thwaytes's painting

34 evidence of sales of painting by other artists which are similar to Caravaggio's work

Questions 35 and 36

Which TWO of these beliefs are expressed by the writer?

A It is possible that Mr Thwaytes might not accept the court's verdict.

B The painting which belonged to Mr Thwates is probably a genuine Caravaggio.

C When Sir Dennis Mahon was purchasing the painting, he already knew it was by Caravaggio.

D Judges frequently make decisions about whether paintings are by particular known artists.

E Greater certainty is required when attributing work to artists than would be needed in other civil cases.

Questions 37 and 42

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

It can be very difficult to know who an old painting is by, especially when there is little information as to its previous **37** ..... , or when the artist worked in a **38** .....

It is important that vendors accurately state in their **39** .....what is or isn't known about who the artist was.

Sotheby's said that Mr Thwaytes's picture was by a **40** ..... of Caravaggio.

The judge believed that the **41** ..... of Mr Thwaytes's painting was not that which would be expected of Caravaggio.

The judge drew particular attention to the way a **42** ..... had been portrayed in the picture, and argued that Caravaggio could and would have painted it differently.

Questions 43

What would be the best title for the article?

A Sotheby's wins case over 'Caravaggio'

B Caravaggio forgery discovered by art collector

C Many great artworks are actually fakes, claims expert

D Judge clarifies misunderstood law on attribution of artworks

Test 5

LISTENING

PART 1 *Questions 1–10*

Complete the form below.

*Write **ONE WORD AND/OR A NUMBER** for each answer.*

City Transport Lost Property Enquiry

Example

Main item lost: suitcase

Description of main item: black with thin **1** ..... stripes

Other items:
- a set of **2** ..... keys
- some documents
- a **3** ..... in a box
- a blue **4** .....

Journey details

Date and time: 2.00–2.30 pm on **5** .....

Basic route: caller travelled from the **6** ..... to Highbury

Mode of travel: caller thinks she left the suitcase in a **7** .....

Personal details

Name: Lisa **8** .....

Address: 15A **9** ..... Rd, Highbury

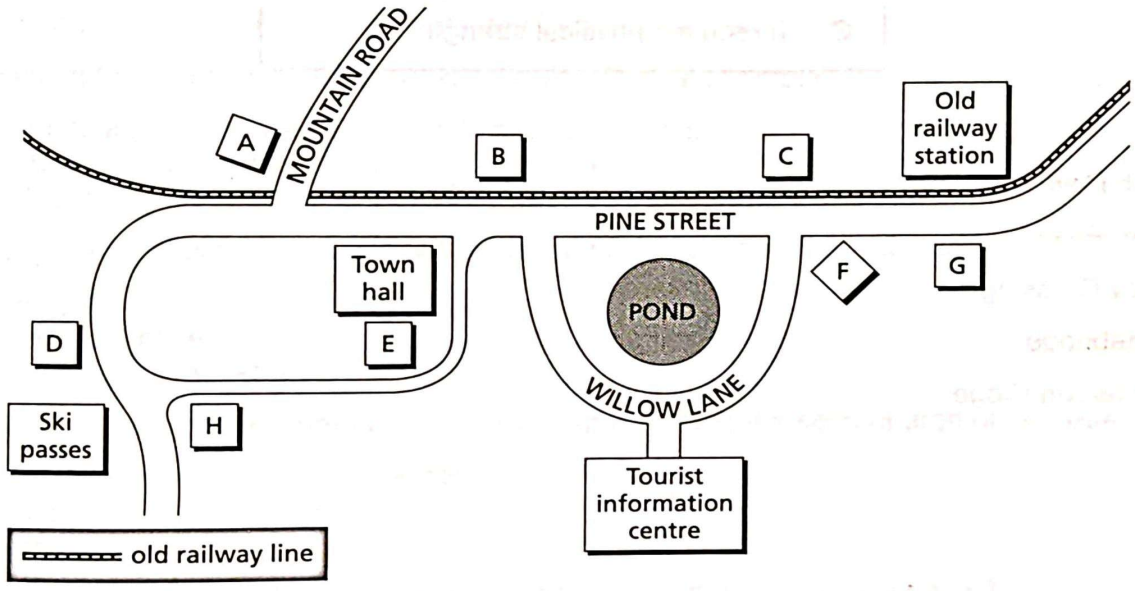
Phone number: **10** .....

PART 2 *Questions 11–20*

Questions 11–15

Label the map below.

*Write the correct letter, **A–H**, next to Questions 11–15.*



11 *supermarket* .....

12 *climbing supplies store* .....

13 *museum* .....

14 *bike hire* .....

15 *café* .....

Questions 16–20

What comment does the speaker make about each of the following tracks?

*Write the correct letter, **A**, **B** or **C**, next to Questions 16–20.*

A	It is possible to get lost here.
B	It only offers basic accommodation.
C	It requires physical strength.

Track

16 North Point

17 Silver River

18 Valley Crossing

19 Stonebridge

20 Henderson Ridge

PART 3 *Questions 21–30*

Questions 21–25

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

21 Why has James chosen to do a case study on the company *Furniture Rossi*?

- **A** It has enjoyed global success.
- **B** It is still in a developmental phase.
- **C** It is an example of a foreign company being rebranded for Australia.

22 According to James, why did Luca Rossi start a furniture company?

- **A** Furniture-making was already a family occupation.
- **B** Rossi saw a need for hand-crafted furniture.
- **C** The work Rossi had done previously was unrewarding.

23 What gave *Furniture Rossi* a competitive advantage over other furniture companies?

- **A** its staff
- **B** its lower prices
- **C** its locally sourced products

24 What does the tutor recommend James does when writing the second draft of his case study?

- **A** provide more detailed references
- **B** check for written accuracy
- **C** add his own views

25 What do the tutor and James agree was wrong with James' last presentation?

- **A** It was too short.
- **B** It focused too much on statistics.
- **C** There was not enough interaction with the audience.

Questions 26–30

Complete the flow-chart below.

*Choose **FIVE** answers from the list below and write the correct letter, **A–G**, next to Questions 26–30.*

A website

B locations

C designs

D TV advertising campaigns

E quality

F values

G software programs

History of *Furniture Rossi*

The product **26** ..... led to a wider customer base.

↓

Greater customer demand meant other **27** ..... were needed.

↓

Better **28** ..... increased overall profitability.

↓

Changes to the **29** ..... were brought on by customer complaints.

↓

Furniture Rossi wants to make people more aware of its **30** ..... .

PART 4 *Questions 31–40*

Questions 31–36

Complete the notes below.

*Write **ONE WORD ONLY** for each answer.*

Rock art

Why rock art is important to researchers

It provides evidence about

- evolution
- **31** .....

Global similarities in rock art

- humans often had large **32** .....
- animals were common, but a **33** ..... was always drawn from the side or from above.
- unlikely that contact through **34** ..... resulted in similar artistic styles

Why our ancestors produced rock art

Research suggests rock art was produced

- firstly for reasons of **35** .....
- later for social, spiritual and **36** ..... reasons.

Questions 37–40

Answer the questions below.

*Write **ONE WORD ONLY** for each answer.*

*What **TWO** images drawn by Aboriginal people show their contact with Europeans?*

- **37** .....
- **38** .....

Which human activities does the lecturer say are the main threats to Aboriginal rock art?

- **39** .....
- vandalism
- **40** .....

READING

READING PASSAGE 1

*You should spend about 20 minutes on **Questions 1–13**, which are based on Reading Passage 1 on the following pages.*

Questions 1–7

*Reading Passage 1 has seven paragraphs, **A–G**.*

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

*Write the correct number, **i–x**, in boxes 1–7 on your answer sheet.*

List of Headings

- **i** How deforestation harms isolated trees
- **ii** How other plants can cause harm
- **iii** Which big trees support the most diverse species
- **iv** Impact of big tree loss on the wider environment
- **v** Measures to prevent further decline in big tree populations
- **vi** How wildlife benefits from big trees
- **vii** Risk from pests and infection
- **viii** Ways in which industry uses big tree products
- **ix** How higher temperatures slow the rate of tree growth
- **x** Factors that enable trees to grow to significant heights

1 Paragraph **A** .....

2 Paragraph **B** .....

3 Paragraph **C** .....

4 Paragraph **D** .....

5 Paragraph **E** .....

6 Paragraph **F** .....

7 Paragraph **G** .....

Trees in trouble

What is causing the decline of the world's giant forests?

A Big trees are incredibly important ecologically. For a start, they sustain countless other species. They provide shelter for many animals, and their trunks and branches can become gardens, hung with green ferns, orchids and bromeliads, coated with mosses and draped with vines. With their tall canopies* basking in the sun, they capture vast amounts of energy. This allows them to produce massive crops of fruit, flowers and foliage that sustain much of the animal life in the forest.

B Only a small number of tree species have the genetic capacity to grow really big. The mightiest are native to North America, but big trees grow all over the globe, from the tropics to the boreal forests of the high latitudes. To achieve giant stature, a tree needs three things: the right place to establish its seedling, good growing conditions and lots of time with low adult mortality*. Disrupt any of these, and you can lose your biggest trees.

C In some parts of the world, populations of big trees are dwindling because their seedlings cannot survive or grow. In southern India, for instance, an aggressive non-native shrub, *Lantana camara*, is invading the floor of many forests. Lantana grows so thickly that young trees often fail to take root. With no young trees to replace them, it is only a matter of time before most of the big trees disappear. Across much of northern Australia, gamba grass from Africa is overrunning native savannah woodlands. The grass grows up to four metres tall and burns fiercely, creating super-hot fires that cause catastrophic tree mortality.

D Without the right growing conditions trees cannot get really big, and there is some evidence to suggest tree growth could slow in a warmer world, particularly in environments that are already warm. Having worked for decades at La Selva Biological Station in Puerto Viejo de Sarapiqui, Costa Rica, David and Deborah Clark and colleagues have shown that tree growth there declines markedly in warmer years. "During the day, their photosynthesis* shuts down when it gets too warm, and at night they consume more energy because their metabolic rate increases, much as a reptile's would when it gets warmer," explains David Clark. With less energy produced in warmer years and more being consumed just to survive, there is even less energy available for growth.

E The Clarks' hypothesis, if correct, means tropical forests would shrink over time. The largest, oldest trees would progressively die off and tend not to be replaced. According to the Clarks, this might trigger a destabilisation of the climate; as older trees die, forests would release some of their stored carbon into the atmosphere, prompting a vicious cycle of further warming, forest shrinkage and carbon emissions.

F Big trees face threats from elsewhere. The most serious is increasing mortality, especially of mature trees. Across much of the planet, forests of slow-growing ancient trees have been cleared for human use. In western North America, most have been replaced by monocultures of fast-growing conifers. Siberia's forests are being logged at an incredible rate. Logging in tropical forests is selective but the timber cutters usually prioritise the biggest and oldest trees. In the Amazon, my colleagues and I found the mortality rate for the biggest trees had tripled in small patches of rainforest

surrounded by pasture land. This happens for two reasons. First, as they grow taller, big trees become thicker and less flexible: when winds blow across the surrounding cleared land, there is nothing to stop their acceleration. When they hit the trees, the impact can snap them in half. Second, rainforest fragments dry out when surrounded by dry, hot pastures and the resulting drought can have devastating consequences: one four-year study has shown that death rates will double for smaller trees but will increase 4.5 times for bigger trees.

G Particular enemies to large trees are insects and disease. Across vast areas of western North America, increasingly mild winters are causing massive outbreaks of bark beetle. These tiny creatures can kill entire forests as they tunnel their way through the inside of trees. In both North America and Europe, fungus-causing diseases such as Dutch elm disease have killed off millions of stately trees that once gave beauty to forests and cities. As a result of human activity, such enemies reach even the remotest corners of the world, threatening to make the ancient giants a thing of the past.

Glossary

a canopy: leaves and branches that form a cover high above the ground

mortality: the number of deaths within a particular group

photosynthesis: a process used by plants to convert the light energy from the sun into chemical energy that can be used as food

Questions 8–13

Complete the sentences below.

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

Write your answers in boxes 8–13.

8 The biggest trees in the world can be found in ..... .

9 Some trees in northern Australia die because of ..... made worse by gamba grass.

10 The Clarks believe that the release of ..... from dead trees could lead to the death of more trees.

11 Strong ..... are capable of damaging tall trees in the Amazon.

12 ..... has a worse impact on tall trees than smaller ones.

13 In western Northern America, a species of ..... has destroyed many trees.

READING PASSAGE 2

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

Whale Strandings

Why do whales leave the ocean and become stuck on beaches?

When the last stranded whale of a group eventually dies, the story does not end there. A team of researchers begins to investigate, collecting skin samples for instance, recording anything that could help them answer the crucial question: why? Theories abound, some more convincing than others. In recent years, navy sonar has been accused of causing certain whales to strand. It is known that noise pollution from offshore industry, shipping and sonar can impair underwater communication, but can it really drive whales onto our beaches?

In 1998, researchers at the Pelagos Cetacean Research Institute, a Greek non-profit scientific group, linked whale strandings with low-frequency sonar tests being carried out by the North Atlantic Treaty Organisation (NATO). They recorded the stranding of 12 Cuvier's beaked whales over 38.2 kilometres of coastline. NATO later admitted it had been testing new sonar technology in the same area at the time as the strandings had occurred. 'Mass' whale strandings involve four or more animals. Typically they all wash ashore together, but in mass atypical strandings (such as the one in Greece), the whales don't strand as a group; they are scattered over a larger area.

For humans, hearing a sudden loud noise might prove frightening, but it does not induce mass fatality. For whales, on the other hand, there is a theory on how sonar can kill. The noise can surprise the animal, causing it to swim too quickly to the surface. The result is decompression sickness, a hazard human divers know all too well. If a diver ascends too quickly from a high-pressure underwater environment to a lower-pressure one, gases dissolved in blood and tissue expand and form bubbles. The bubbles block the flow of blood to vital organs, and can ultimately lead to death.

Plausible as this seems, it is still a theory and based on our more comprehensive knowledge of land-based animals. For this reason, some scientists are wary. Whale expert Karen Evans is one such scientist. Another is Rosemary Gales, a leading expert on whale strandings. She says sonar technology cannot always be blamed for mass strandings. "It's a case-by-case situation. Whales have been stranding for a very long time – pre-sonar." And when 80% of all Australian whale strandings occur around Tasmania, Gales and her team must continue in the search for answers.

When animals beach next to each other at the same time, the most common cause has nothing to do with humans at all. "They're highly social creatures," says Gales. "When they mass strand – it's complete panic and chaos. If one of the group strands and sounds the alarm, others will try to swim to its aid, and become stuck themselves."

Activities such as sonar testing can hint at *when* a stranding may occur, but if conservationists are to reduce the number of strandings, or improve rescue operations, they need information on *where* strandings are likely to occur as well. With this in mind, Ralph James, physicist at the University of Western Australia in Perth, thinks he may have discovered why whales turn up only on some beaches. In 1986 he went to Augusta, Western Australia, where more than 100 false killer whales had beached. "I found out from chatting to the locals that whales had been stranding there for decades. So I asked myself, what is it about this beach?" From this question that James pondered over 20 years ago, grew the university's Whale Stranding Analysis Project.

Data has since revealed that all mass strandings around Australia occur on gently sloping sandy beaches, some with inclines of less than 0.5%. For whale species that depend on an echolocation system to navigate, this kind of beach spells disaster. Usually, as they swim, they make clicking noises, and the resulting sound waves are reflected in an echo and travel back to them. However, these just fade out on shallow beaches, so the whale doesn't hear an echo and it crashes onto the shore.

But that is not all. Physics, it appears, can help with the *when* as well as the *where*. The ocean is full of bubbles. Larger ones rise quickly to the surface and disappear, whilst smaller ones – called microbubbles – can last for days. It is these that absorb whale 'clicks'. "Rough weather generates more bubbles than usual," James adds. So, during and after a storm, echolocating whales are essentially swimming blind.

Last year was a bad one for strandings in Australia. Can we predict if this – or any other year – will be any better? Some scientists believe we can. They have found trends which could be used to forecast 'bad years' for strandings in the future. In 2005, a survey by Klaus Vanselow and Klaus Ricklefs of sperm whale strandings in the North Sea even found a correlation between these and the sunspot cycle, and suggested that changes in the Earth's magnetic field might be involved. But others are sceptical. "Their study was interesting ... but the analyses they used were flawed on a number of levels," says Evans. In the same year, she co-authored a study on Australian strandings that uncovered a completely different trend. "We analysed data from 1920 to 2002 ... and observed a clear periodicity in the number of whales stranded each year that coincides with a major climatic cycle." To put it more simply, she says, in the years when strong westerly and southerly winds bring cool water rich in nutrients closer to the Australia coast, there is an increase in the number of fish. The whales follow.

So what causes mass strandings? "It's probably many different components," says James. And he is probably right. But the point is we now know what many of those components are.

Questions 14–17

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

Write your answers in boxes 14–17 on your answer sheet.

14 What do researchers often take from the bodies of whales?

15 What do some industries and shipping create that is harmful to whales?

16 In which geographical region do most whale strandings in Australia happen?

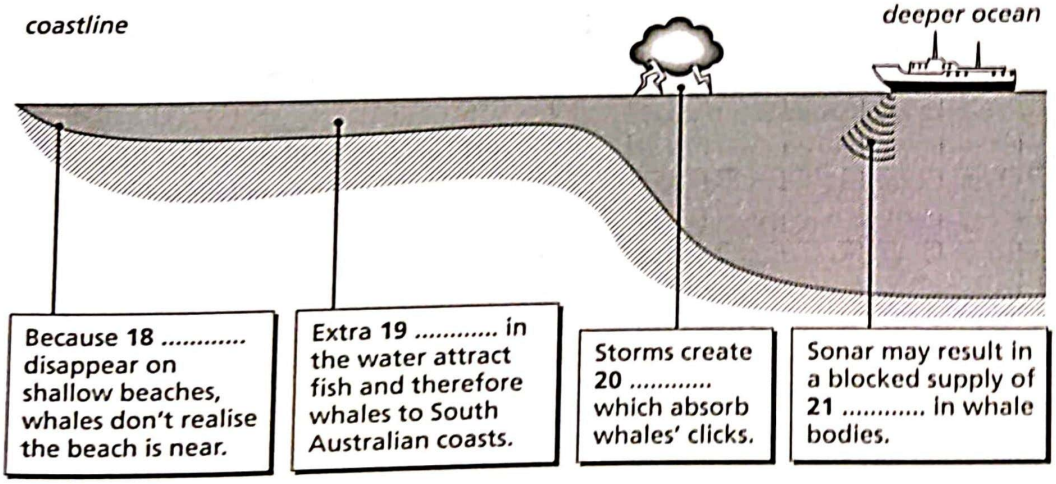
17 Which kind of whale was the subject of a study in the North Sea?

Questions 18–21

Label the diagram below.

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

Write your answers in boxes 18–21 on your answer sheet.



Questions 22–26

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

In boxes 22–26 on your answer sheet, write

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

22 The aim of the research by the Pelagos Institute in 1998 was to prove that navy sonar was responsible for whale strandings.

23 The whales stranded in Greece were found at different points along the coast.

24 Rosemary Gales has questioned the research techniques used by the Greek scientists.

25 According to Gales, whales are likely to try to help another whale in trouble.

26 There is now agreement amongst scientists that changes in the Earth's magnetic fields contribute to whale strandings.

READING PASSAGE 3

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

Science in Space

How will NASA transform the International Space Station from a building site into a cutting-edge research laboratory?

A premier, world-class laboratory in low Earth orbit. That was how the National Aeronautics and Space Administration agency (NASA) sold the International Space Station (ISS) to the US Congress in 2001. Today no one can doubt the agency's technological ambition. The most complex engineering project ever attempted has created an enormous set of interlinked modules that orbits the planet at more than 27,000 kilometres per hour. It might be travelling fast but, say critics, as a lab it is going nowhere. So far, it has gone through $150 billion.

So where should its future priorities lie? This question was addressed at the recent 1st annual ISS research and development conference in Colorado. Among the presenters was Satoshi Iwase of Aichi Medical University in Japan who has spent several years developing an experiment that could help solve one of the key problems that humans will face in space: keeping our bodies healthy in weightlessness. One thing that physiologists have learned is that without gravity our bodies begin to lose strength, leaving astronauts with weakened bones, muscles and cardiovascular systems. To counter these effects on a long-duration mission to, say, Mars, astronauts will almost certainly need to create their own artificial gravity. This is where Iwase comes in. He leads a team designing a centrifuge for humans. In their preliminary design, an astronaut is strapped into the seat of a machine that resembles an exercise bike. Pedalling provides a workout for the astronaut's muscles and cardiovascular system, but it also causes the seat to rotate vertically around a central axis so the rider experiences artificial gravity while exercising.

The centrifuge project highlights the station's potential as a research lab. Similar machines have flown in space aboard NASA's shuttles, but they couldn't be tested for long enough to prove whether they were effective. It's been calculated that to properly assess a centrifuge's impact on human physiology, astronauts would have to ride it for 30 minutes a day for at least two months. 'The only way to test this is in weightlessness, and the only time we have to do that is on the space station,' says Laurence Young, a space medicine expert at the Massachusetts Institute of Technology.

There are certainly plenty of ideas for other experiments: but many projects have yet to fly. Even if the centrifuge project gets the green light, it will have to wait another five years before the station's crew can take a spin. Lengthy delays like this are one of the key challenges for NASA, according to an April 2011 report from the US National Academy of Sciences. Its authors said they were 'deeply concerned' about the state of NASA's science research, and made a number of recommendations. Besides suggesting that the agency reduces the time between approving experiments and sending them into space, it also recommended setting clearer research priorities.

NASA has already begun to take action, hiring management consultants ProOrbis to develop a plan to cut through the bureaucracy. And Congress also directed NASA to hire an independent organisation, the Centre for the Advancement of Science in Space (CASIS), to help manage the station's US lab facilities. One of CASIS's roles is to convince public and private investors that science on the station is worth the spend because judged solely by the number of papers published, the ISS certainly seems poor value: research on the station has generated about 3,100 papers since 1998. The Hubble Space Telescope, meanwhile, has produced more than 11,300 papers in just over 20 years, yet it cost less than one-tenth of the price of the space station.

Yet Mark Uhran, assistant associate administrator for the ISS, refutes the criticism that the station hasn't done any useful research. He points to progress made on a salmonella vaccine, for example. To get the ISS research back on track, CASIS has examined more than 100 previous microgravity experiments to identify promising research themes. From this, it has opted to focus on life science and medical research, and recently called for proposals for experiments on muscle wasting, osteoporosis and the immune system. The organisation also maintains that the ISS should be used to develop products with commercial application and to test those that are either close to or already on the market. Investment from outside organisations is vital, says Uhran, and a balance between academic and commercial research will help attract this.

The station needs to attract cutting-edge research, yet many scientists seem to have little idea what goes on aboard it. Jeanne DiFrancesco at ProOrbis conducted more than 200 interviews with people from organisations with potential interests in low gravity studies. Some were aware of the ISS but they didn't know what's going on up there, she says. 'Others know there's science, but they don't know what kind.'

According to Alan Stern, planetary scientist, the biggest public relations boost for the ISS may come from the privately funded space flight industry. Companies like *SpaceX* could help NASA and its partners when it comes to resupplying the ISS, as it suggests it can reduce launch costs by two-thirds. Virgin Atlantic's *SpaceShipTwo* or *Zero2Infinity*'s high-altitude balloon could also boost the space station's fortunes. They might not come close to the ISS's orbit, yet Stern believes they will revolutionise the way we, the public, see space. Soon everyone will be dreaming of interplanetary travel again, he predicts. More importantly, scientists are already queuing for seats on these low-gravity space-flight services so they can collect data during a few minutes of weightlessness. This demand for low-cost space flight could eventually lead to a service running on a more frequent basis, giving researchers the chance to test their ideas before submitting a proposal for experiments on the ISS. Getting flight experience should help them win a slot on the station, says Stern.

Questions 27–30

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

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

27 What does the writer state about the ISS in the first paragraph?

A Its manufacture has remained within the proposed budget.
B It is a great example of technological achievement.
C There are doubts about the speed it has attained.
D NASA should have described its purpose more accurately.

28 What are we told about Satoshi Iwase's experimental machine?

A It is based on conventional exercise equipment.
B It was originally commissioned by NASA.
C It is designed only to work in low-gravity environments.
D It has benefits that Iwase did not anticipate.

29 The writer refers to the Hubble Space Telescope in order to

A show why investment in space technology has decreased.
B highlight the need to promote the ISS in a positive way.
C explain which kind of projects are more likely to receive funding.
D justify the time required for a space project to produce results.

30 In the sixth paragraph, we are told that CASIS has

A rejected certain applications for experiments on the ISS.
B expressed concern about testing products used for profit.
C questioned the benefits of some of the projects currently on the ISS.
D invited researchers to suggest certain health-based projects.

Questions 31–35

Look at the following opinions (Questions 31–35) and the list of people below.

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

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

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

31 The ISS should be available for business-related ventures.

32 There is general ignorance about what kinds of projects are possible on the ISS.

33 The process of getting accepted projects onto the ISS should be speeded up.

34 Some achievements of the ISS are underrated.

35 To properly assess new space technology, there has to be an absence of gravity.

List of people

A Laurence Young
B Authors of the US National Academy of Sciences report
C Mark Uhran
D Jeanne DiFrancesco

Questions 36–39

*Complete the summary using the lists of words, **A–H**, below.*

*Write the correct letter, **A–H**, in boxes 36–39 on your answer sheet.*

The influence of commercial space flight on the ISS

According to Alan Stern, private space companies could affect the future of the ISS. He believes they could change its image; firstly because sending food and equipment there would be more **36** ..... if a commercial craft were used, and secondly, because commercial flights might make the whole idea of space exploration seem **37** ..... to ordinary people. Another point is that as the demand for space flights increases, there is a chance of them becoming more **38** ..... . And by working on a commercial flight first, scientists would be more **39** ..... if an ISS position came up.

A safe	**B** competitive	**C** flexible	**D** real
E rapid	**F** regular	**G** suitable	**H** economical

Question 40

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

Write the correct letter in box 40 on your answer sheet.

40 The writer's purpose in writing this article is to

A promote the advantages of space flight in general.
B illustrate how the ISS could become more effective.
C criticise the ISS for its narrow-minded attitude.
D contrast useful and worthless space projects.

Test 6

LISTENING

PART 1 *Questions 1–10*

Complete the notes below.

*Write **ONE WORD AND/OR A NUMBER** for each answer.*

ACCOMMODATION FORM: RENTAL PROPERTIES

Example	*Answer*
Name:	Jane Ryder
Contact phone number:	**1** (0044) .....
Email address:	**2** richard@..... co.uk
Occupation:	a local **3** .....
Type of accommodation:	a 2-bedroom apartment wanted (must have its own **4** .....)
	no **5** ..... required (family bringing theirs)
	a **6** ..... in the kitchen is preferable
Preferred location:	near a **7** .....
Maximum rent:	**8** ..... per month
Other requests:	the accommodation has to be **9** ..... in the daytime
How did you first hear about us?	through a **10** .....

PART 2 *Questions 11–20*

Questions 11–15

Complete the sentences below.

*Write **NO MORE THAN TWO WORDS** for each answer.*

The police officer suggests neighbours give each other their **11** .....

Neighbours should discuss what to do if there's any kind of **12** .....

It's a good idea to leave on the **13** .....

Think carefully about where you put any **14** .....

It's a good idea to buy good-quality **15** .....

Questions 16–20

Which crime prevention measure is proposed for each area affected by crime?

*Choose **FIVE** answers from the box and write the correct letter, **A–G**, next to Questions 16–20.*

Proposed crime prevention measures	
A	install more lighting
B	have more police officers on patrol
C	remove surrounding vegetation
D	contact local police
E	fix damage quickly
F	change road design
G	use security cameras

Areas affected by crime

16 skate park .....

17 local primary schools .....

18 Abbotsford Street .....

19 shops on Victoria Street .....

20 supermarket car park .....

PART 3 *Questions 21–30*

Questions 21–26

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

Presentation on the problems and potential of biofuels

21 Mike suggests they begin their presentation by

A explaining what kind of harm is caused by fossil fuels.
B pointing out that biofuels were in use before fossil fuels.
C ensuring students know the difference between fossil fuels and biofuels.

22 Karina doesn't want to discuss the production of ethanol because

A other students will already be familiar with the process.
B there will not be time to cover more important information.
C they may not provide an accurate description.

23 Which source of biofuel do the students agree is least environmentally friendly?

A sugar cane
B corn
C canola

24 What is the main problem facing the development of the biofuel industry in the USA?

A inadequate infrastructure for transporting ethanol
B not enough farmers growing biofuel crops
C little government support of biofuel development

25 Karina doubts that sugar cane production in Brazil will

A lead to the loss of wildlife habitats.
B create a large number of jobs in the biofuel sector.
C continue to provide enough energy for the country's needs.

26 Karina and Mike conclude that in order to increase the use of biofuels

A the price of fossil fuels must go up.
B more machinery must be adapted to use them.
C production methods must be more energy-efficient.

Questions 27–30

Answer the questions below.

*Write **NO MORE THAN TWO WORDS** for each answer.*

*What **TWO** biofuel-related problems do Mike and Karina decide to focus on in the last section of their presentation?*

- **27** .....
- **28** .....

Which two sources of biofuel do Mike and Karina say are being tried out?

- **29** .....
- algae
- **30** .....

PART 4 *Questions 31–40*

Questions 31–34

Complete the summary below.

Write ***ONE WORD ONLY*** *for each answer.*

The 'weak-tie' theory: how friends-of-friends influence us

In 1973, Mark Granovetter claimed that the influence of 'weak-ties' can affect the behaviour of populations in the fields of information science, politics and **31** _____. Although friends-of-friends may be unlike us, they have similar enough **32** _____ to have a beneficial effect on our lives. An example of this influence is when we hear about **33** _____ because information about them is provided by weak-ties. Since Granovetter proposed his theory, other studies have shown that weak-tie networks also benefit our **34** _____.

Questions 35 and 36

*Choose **TWO** letters, **A–E**.*

*Which does the speaker believe are **TWO** real benefits of online social networking?*

A people can gain higher self-esteem

B people can access useful medical information

C people can form relationships more quickly

D people can improve academic performance

E people can be reliably informed about current affairs

Questions 37 and 38

*Choose **TWO** letters, **A–E**.*

*Which **TWO** problems related to online social networking will increase, according to the speaker?*

A criminal activity

B poorer grades at school

C a decline in physical fitness

D less work done by employees

E loss of career prospects

Questions 39 and 40

*Choose **TWO** letters, **A–E**.*

*Which **TWO** claims are made by Robin Dunbar about social networking sites?*

A They are not helpful for developing certain social skills.

B They cannot fully reveal a person's real character.

C They are not a good starting point for building new relationships.

D They do not encourage people to widen their social circle.

E They will not retain their popularity with the young generation.

READING

READING PASSAGE 1

*You should spend about 20 minutes on **Questions 1–13**, which are based on Reading Passage 1 on the following page.*

Questions 1–6

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

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

*Write the correct number, **i–ix**, in boxes 1–6 on your answer sheet.*

List of Headings

- **i** A business-model approach to education
- **ii** The reforms that improved education in Finland
- **iii** Educational challenges of the future
- **iv** Ways in which equality is maintained in the Finnish education system
- **v** The benefits of the introduction of testing
- **vi** An approach that helped a young learner
- **vii** Statistical proof of education success
- **viii** Support for families working and living in Finland
- **ix** The impact of the education system on Finland's economy

1 Paragraph **A** .....

2 Paragraph **B** .....

3 Paragraph **C** .....

4 Paragraph **D** .....

5 Paragraph **E** .....

6 Paragraph **F** .....

Why Are Finland's Schools Successful?

The country's achievements in education have other nations doing their homework

A At Kirkkojarvi Comprehensive School in Espoo, a suburb west of Helsinki, Kari Louhivuori, the school's principal, decided to try something extreme by Finnish standards. One of his sixth-grade students, a recent immigrant, was falling behind, resisting his teacher's best efforts. So he decided to hold the boy back a year. Standards in the country have vastly improved in reading, math and science literacy over the past decade, in large part because its teachers are trusted to do whatever it takes to turn young lives around. 'I took Besart on that year as my private student,' explains Louhivuori. When he was not studying science, geography and math, Besart was seated next to Louhivuori's desk, taking books from a tall stack, slowly reading one, then another, then devouring them by the dozens. By the end of the year, he had conquered his adopted country's vowel-rich language and arrived at the realization that he could, in fact, *learn.*

B This tale of a single rescued child hints at some of the reasons for Finland's amazing record of education success. The transformation of its education system began some 40 years ago but teachers had little idea it had been so successful until 2000. In this year, the first results from the Programme for International Student Assessment (PISA), a standardized test given to 15-year-olds in more than 40 global venues, revealed Finnish youth to be the best at reading in the world. Three years later, they led in math. By 2006, Finland was first out of the 57 nations that participate in science. In the latest PISA scores, the nation came second in science, third in reading and sixth in math among nearly half a million students worldwide.

C In the United States, government officials have attempted to improve standards by introducing marketplace competition into public schools. In recent years, a group of Wall Street financiers and philanthropists such as Bill Gates have put money behind private-sector ideas, such as charter schools, which have doubled in number in the past decade. President Obama, too, apparently thought competition was the answer. One policy invited states to compete for federal dollars using tests and other methods to measure teachers, a philosophy that would not be welcome in Finland. 'I think, in fact, teachers would tear off their shirts,' said Timo Heikkinen, a Helsinki principal with 24 years of teaching experience. 'If you only measure the statistics, you miss the human aspect.'

D There are no compulsory standardized tests in Finland, apart from one exam at the end of students' senior year in high school. There is no competition between students, schools or regions. Finland's schools are publicly funded. The people in the government agencies running them, from national officials to local authorities, are educators rather than business people or politicians. Every school has the same national goals and draws from the same pool of university-trained educators. The result is that a Finnish child has a good chance of getting the same quality education no matter whether he or she lives in a rural village or a university town.

E It's almost unheard of for a child to show up hungry to school. Finland provides three years of maternity leave and subsidized day care to parents, and preschool for all five-year-olds, where the emphasis is on socializing. In addition, the state subsidizes parents, paying them around 150 euros per month for every child until he or she turns 17. Schools provide food, counseling and taxi service if needed. Health care is even free for students taking degree courses.

F Finland's schools were not always a wonder. For the first half of the twentieth century, only the privileged got a quality education. But in 1963, the Finnish Parliament made the bold decision to choose public education as the best means of driving the economy forward and out of recession. Public schools were organized into one system of comprehensive schools for ages 7 through 16. Teachers from all over the nation contributed to a national curriculum that provided guidelines, not prescriptions, for them to refer to. Besides Finnish and Swedish (the country's second official language), children started learning a third language (English is a favorite) usually beginning at age nine. The equal distribution of equipment was next, meaning that all teachers had their fair share of teaching resources to aid learning. As the comprehensive schools improved, so did the upper secondary schools (grades 10 through 12). The second critical decision came in 1979, when it was required that every teacher gain a fifth-year Master's degree in theory and practice, paid for by the state. From then on, teachers were effectively granted equal status with doctors and lawyers. Applicants began flooding teaching programs, not because the salaries were so high but because autonomous decision-making and respect made the job desirable. And as Louhivuori explains, 'We have our own motivation to succeed because we love the work.'

Questions 7–13

Complete the notes below.

*Choose **NO MORE THAN TWO WORDS AND/OR A NUMBER** from the passage for each answer.*

Write your answers in boxes 7–13 on your answer sheet.

The school system in Finland

PISA tests

- In the most recent tests, Finland's top subject was **7** .....

History

1963:

- A new school system was needed to improve Finland's **8** ..... .
- Schools followed **9** ..... that were created partly by teachers.
- Young pupils had to study an additional **10** ..... .
- All teachers were given the same **11** ..... to use.

1979:

- Teachers had to get a **12** ..... but they did not have to pay for this.
- Applicants were attracted to the **13** ..... that teaching received.

READING PASSAGE 2

*You should spend about 20 minutes on **Questions 14–26**, which are based on Reading Passage 2 on the following pages.*

Questions 14–18

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

Which paragraphs contain the following information?

*Write the correct letter, **A–F**, in boxes 14–18 on your answer sheet.*

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

14 descriptions of naturally occurring events that make the past hard to trace

15 an account of the discovery of a particular animal which had died out

16 the reason why a variety of animals all died in the same small area

17 the suggestion that a procedure to uncover fossilised secrets was inappropriate

18 examples of the kinds of animals that did not die out as a result of hunting

Questions 19 and 20

*Choose **TWO** letters, **A–E**.*

Write the correct letters in boxes 19 and 20 on your answer sheet.

*Which **TWO** of these possible reasons for Australian megafauna extinction are mentioned in the text?*

A human activity

B disease

C loss of habitat

D a drop in temperature

E the introduction of new animal species

Questions 21 and 22

*Choose **TWO** letters, **A–E**.*

Write the correct letters in boxes 21 and 22 on your answer sheet.

The list below shows possible forms of proof for humans having contact with Australian megafauna.

*Which **TWO** possible forms of proof does the writer say have been found in Australia?*

A bone injury caused by a man-made object

B bones near to early types of weapon

C man-made holes designed for trapping animals

D preserved images of megafauna species

E animal remains at camp fires

Questions 23–26

Do the following statements agree with the claims of the writer in Reading Passage 2?

In boxes 23–26 on your answer sheet, write

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

23 Extinct megafauna should receive more attention than the extinction of the dinosaurs.

24 There are problems with Paul Martin's 'blitzkrieg' hypothesis for the Americas.

25 The Aborigines should have found a more effective way to protest about Flannery's book.

26 There is sufficient evidence to support Tim Flannery's ideas about megafauna extinction.

Australia's Lost Giants

What happened to Australia's megafauna, the giant animals that once existed across this enormous continent?

A In 1969, a fossil hunter named Rod Wells came to Naracoorte in South Australia to explore what was then known as Victoria Cave. Wells clawed through narrow passages, and eventually into a huge chamber. Its floor of red soil was littered with strange objects. It took Wells a moment to realize what he was looking at; the bones of thousands of creatures that must have fallen through holes in the ground above and become trapped. Some of the oldest belonged to mammals far larger than any found today in Australia. They were the ancient Australian megafauna – huge animals of the Pleistocene epoch. In boneyards across the continent, scientists have found the fossils of a giant snake, a huge flightless bird, and a seven foot kangaroo, to name but a few. Given how much ink has been spilled on the extinction of the dinosaurs, it's a wonder that even more hasn't been devoted to megafauna. Prehistoric humans never threw spears at *Tyrannosaurus rex* but really did hunt mammoths and mastodons.

B The disappearance of megafauna in America – mammoths, saber-toothed cats, giant sloths, among others – happened relatively soon after the arrival of human beings, about 13,000 years ago. In the 1960s, paleoecologist Paul Martin developed what became known as the *blitzkrieg hypothesis.* Modern humans, Martin said, created havoc as they spread through the Americas, wielding spears to annihilate animals that had never faced a technological predator. But this period of extinction wasn't comprehensive. North America kept its deer, black bears and a small type of bison, and South America its jaguars and llamas.

C What happened to Australia's large animals is baffling. For years scientists blamed the extinctions on climate change. Indeed, Australia has been drying out for over a million years, and the megafauna were faced with a continent where vegetation began to disappear. Australian paleontologist Tim Flannery suggests that people, who arrived on the continent around 50,000 years ago, used fire to hunt, which led to deforestation. Here's what's certain, Flannery says. Something dramatic happened to Australia's dominant land creatures – somewhere around 46,000 years ago, strikingly soon after the invasion of a tool-wielding, highly intelligent predator.

In Flannery's 1994 book called *The Future Eaters,* he sets out his thesis that human beings are a new kind of animal on the planet, and are in general, one prone to ruining ecosystems. Flannery's book proved highly controversial. Some viewed it as critical of the Aborigines, who pride themselves on living in harmony with nature. The more basic problem with Flannery's thesis is that there is no direct evidence that they killed any Australian megafauna. It would be helpful if someone uncovered a *Diprotodon* skeleton with a spear point embedded in a rib – or perhaps *Thylacoleo* bones next to the charcoal of a human campfire. Such kill sites have been found in the Americas but not in Australia.

D The debate about megafauna pivots to a great degree on the techniques for dating old bones and the sediments in which they are buried. If scientists can show that the megafauna died out fairly quickly and that this extinction event happened within a few hundred, or even a couple thousand years, of the arrival of people, that's a strong case – even if a purely circumstantial one – that the one thing was the direct result of the other. As it happens, there is one place where there may be such evidence: Cuddie Springs in New South Wales. Today the person most vocal about the site is archeologist Judith Field. In 1991, she discovered megafauna bones directly adjacent to stone tools – a headline-making find. She says there are two layers showing the association, one about 30,000 years old, the other 35,000 years old. If that dating is accurate, it would mean humans and megafauna coexisted in Australia for something like 20,000 years. "What Cuddie Springs demonstrates is that you have an extended overlap of humans and megafauna," Field says. Nonsense, say her critics. They say the fossils have been moved from their original resting places and redeposited in younger sediments.

E Another famous boneyard in the same region is a place called Wellington Caves, where *Diprotodon*, the largest known marsupial*, was first discovered. Scientist Mike Augee says that: "This is a sacred site in Australian paleontology." Here's why: In 1830 a local official named George Rankin lowered himself into the cave on a rope tied to a protrusion in the cave wall. The protrusion turned out to be a bone. A surveyor named Thomas Mitchell arrived later that year, explored the caves in the area, and shipped fossils off to Richard Owen, the British paleontologist who later gained fame for revealing the existence of dinosaurs. Owen recognized that the Wellington cave bones belonged to an extinct marsupial. Later, between 1909 and 1915 sediments in Mammoth Cave that contained fossils were hauled out and examined in a chaotic manner that no scientist today would approve. Still, one bone in particular has drawn extensive attention: a femur with a cut in it, possibly left there by a sharp tool.

F Unfortunately, the Earth preserves its history haphazardly. Bones disintegrate, the land erodes, the climate changes, forests come and go, rivers change their course – and history, if not destroyed, is steadily concealed. By necessity, narratives are constructed from limited data. Australia's first people expressed themselves in rock art. Paleontologist Peter Murray has studied a rock painting in far northern Australia that shows what looks very much like a megafauna marsupial known as *Palorchestes*. In Western Australia another site shows what appears to be a hunter with either a marsupial lion or a Tasmanian tiger – a major distinction, since the marsupial lion went extinct and the much smaller Tasmanian tiger survived into the more recent historical era. But as Murray says, "Every step of the way involves interpretation. The data doesn't just speak for itself."

Glossary

marsupial: an animal which carries its young in a pouch
e.g. kangaroos and koalas

READING PASSAGE 3

*You should spend about 20 minutes on **Questions 31–40**, which are based on Reading Passage 3 below.*

The Swiffer

For a fascinating tale about creativity, look at a cleaning product called the *Swiffer* and how it came about, urges writer Jonah Lehrer. In the story of the *Swiffer*, he argues, we have the key elements in producing breakthrough ideas: frustration, moments of insight and sheer hard work. The story starts with a multinational company which had invented products for keeping homes spotless, and couldn't come up with better ways to clean floors, so it hired designers to watch how people cleaned. Frustrated after hundreds of hours of observation, they one day noticed a woman do with a paper towel what people do all the time: wipe something up and throw it away. An idea popped into lead designer Harry West's head: the solution to their problem was a floor mop with a disposable cleaning surface. Mountains of prototypes and years of teamwork later, they unveiled the *Swiffer*, which quickly became a commercial success.

Lehrer, the author of *Imagine*, a new book that seeks to explain how creativity works, says this study of the imagination started from a desire to understand what happens in the brain at the moment of sudden insight. 'But the book definitely spiraled out of control,' Lehrer says. 'When you talk to creative people, they'll tell you about the 'eureka'* moment, but when you press them they also talk about the hard work that comes afterwards, so I realised I needed to write about that, too. And then I realised I couldn't just look at creativity from the perspective of the brain, because it's also about the culture and context, about the group and the team and the way we collaborate.'

When it comes to the mysterious process by which inspiration comes into your head as if from nowhere, Lehrer says modern neuroscience has produced a 'first draft' explanation of what is happening in the brain. He writes of how burnt-out American singer Bob Dylan decided to walk away from his musical career in 1965 and escape to a cabin in the woods, only to be overcome by a desire to write. Apparently '*Like a Rolling Stone*' suddenly flowed from his pen. 'It's like a ghost is writing a song,' Dylan has reportedly said. 'It gives you the song and it goes away.' But it's no ghost, according to Lehrer.

Instead, the right hemisphere of the brain is assembling connections between past influences and making something entirely new. Neuroscientists have roughly charted this process by mapping the brains of people doing word puzzles solved by making sense of remotely connecting information. For instance, subjects are given three words – such as 'age', 'mile' and 'sand' – and asked to come up with a single word that can precede or follow each of them to form a compound word. (It happens to be 'stone'.) Using brain-imaging equipment, researchers discovered that when people get the answer in an apparent flash of insight, a small fold of tissue called the anterior superior temporal gyrus suddenly lights up just beforehand. This stays silent when the word puzzle is solved through careful analysis. Lehrer says that this area of the brain lights up only after we've hit the wall on a problem. Then the brain starts hunting through the 'filing cabinets of the right hemisphere' to make the connections that produce the right answer.

Studies have demonstrated it's possible to predict a moment of insight up to eight seconds before it arrives. The predictive signal is a steady rhythm of alpha waves emanating from the brain's right hemisphere, which are closely associated with relaxing activities. 'When our minds are at ease – when those alpha waves are rippling through the brain – we're more likely to direct the spotlight of attention towards that stream of remote associations emanating from the right hemisphere,' Lehrer writes. 'In contrast, when we are diligently focused, our attention tends to be towards the details of the problems we are trying to solve.' In other words, then we are less likely to make those vital associations. So, heading out for a walk or lying down are important phases of the creative process, and smart companies know this. Some now have a policy of encouraging staff to take time out during the day and spend time on things that at first glance are unproductive (like playing a PC game), but day-dreaming has been shown to be positively correlated with problem-solving. However, to be more imaginative, says Lehrer, it's also crucial to collaborate with people from a wide range of backgrounds because if colleagues are too socially intimate, creativity is stifled.

Creativity, it seems, thrives on serendipity. American entrepreneur Steve Jobs believed so. Lehrer describes how at Pixar Animation, Jobs designed the entire workplace to maximise the chance of strangers bumping into each other, striking up conversations and learning from one another. He also points to a study of 766 business graduates who had gone on to own their own companies. Those with the greatest diversity of acquaintances enjoyed far more success. Lehrer says he has taken all this on board, and despite his inherent shyness, when he's sitting next to strangers on a plane or at a conference, forces himself to initiate conversations. As for predictions that the rise of the Internet would make the need for shared working space obsolete, Lehrer says research shows the opposite has occurred; when people meet face-to-face, the level of creativity increases. This is why the kind of place we live in is so important to innovation. According to theoretical physicist Geoffrey West, when corporate institutions get bigger, they often become less receptive to change. Cities, however, allow our ingenuity to grow by pulling huge numbers of different people together, who then exchange ideas. Working from the comfort of our homes may be convenient, therefore, but it seems we need the company of others to achieve our finest 'eureka' moments.

Glossary

Eureka: In ancient Greek, the meaning was 'I have found!'. Now it can be used when people suddenly find the solution to a difficult problem and want to celebrate.

Questions 27–30

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

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

27 What are we told about the product called a 'Swiffer'?

A Its designers had little experience working with household objects.
B Once the idea for it was conceived, it did not take long to develop.
C It achieved profits beyond the manufacturer's expectations.
D Its design was inspired by a common housework habit.

28 When Jonah Lehrer began writing his book,

A he had not intended to focus on creativity.
B he ended up revising his plans for the content.
C he was working in a highly creative environment.
D he was driven by his own experience of the 'eureka' moment.

29 Lehrer refers to the singer Bob Dylan in order to

A illustrate how ideas seem spontaneous.
B exemplify ways in which we might limit our inventiveness.
C contrast different approaches to stimulating the imagination.
D propose particular approaches to regaining lost creativity.

30 What did neuroscientists discover from the word puzzle experiment?

A Memories are easier to retrieve when they are more meaningful.
B An analytical approach to problem-solving is not necessarily effective.
C One part of the brain only becomes active when a connection is made suddenly.
D Creative people tend to take a more instinctive approach to solving language problems.

Questions 31–34

*Complete each sentence with the correct ending, **A–G**, below.*

*Write the correct letter, **A–G**, in boxes 31–34 on your answer sheet.*

31 Scientists know a moment of insight is coming

32 Mental connections are much harder to make

33 Some companies require their employees to stop working

34 A team will function more successfully

A	when people are not too familiar with one another.
B	because there is greater activity in the right side of the brain.
C	if people are concentrating on the specifics of a problem.
D	so they can increase the possibility of finding answers.
E	when people lack the experience required for problem-solving.
F	when the brain shows strong signs of distraction.
G	when both hemispheres of the brain show activity.

Questions 35–39

Complete the notes below.

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

Write your answers in boxes 35–39 on your answer sheet.

How other people influence our creativity

- Steve Jobs
  - made changes to the **35** ..... to encourage interaction at Pixar.
- Lehrer
  - company owners must have a wide range of **36** ..... to do well.
  - it's important to start **37** ..... with new people
  - the **38** ..... has not replaced the need for physical contact.
- Geoffrey West
  - living in **39** ..... encourages creativity.

Question 40

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

Write the correct letter in box 40 on your answer sheet.

40 Which of the following is the most suitable title for Reading Passage 3?

A Understanding what drives our moments of inspiration
B Challenging traditional theories of human creativity
C Creative solutions for enhancing professional relationships
D How the future is shaped by innovative ideas and inspired people

Test 7

LISTENING

PART 1 *Questions 1–10*

Questions 1–6

Complete the table below.

*Write **NO MORE THAN ONE WORD AND/OR A NUMBER** for each answer.*

Hostel accommodation in Darwin

Name	Price per person (dormitory rooms)	Comments and reviews
Example Top End Backpackers	$19	• parking available • staff are **1** ..... • nice pool • air-conditioning is too **2** .....
Gum Tree Lodge	**3** $	• good quiet location • pool and gardens • **4** ..... in the dormitories
Kangaroo Lodge	$22	• downtown location • reception at the lodge is always open • no lockers in the rooms • the **5** ..... are very clean • seems to be a **6** ..... every night

Questions 7–10

Complete the notes below.

*Write **ONE WORD ONLY** for each answer.*

Kangaroo Lodge

Address: on **7** ..... Lane

General information about hostel accommodation

- sheets are provided
- can hire a **8** .....
- **9** ..... is included
- a shared **10** ..... is available

PART 2 *Questions 11–20*

Questions 11–16

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

Anglia Sculpture Park

11 The land where the Sculpture Park is located was previously

A completely covered by forest.
B the site of a private house.
C occupied by a factory.

12 What is unusual about the Anglia Sculpture Park?

A Artists have made sculptures especially for it.
B Some of its sculptures were donated by the artists.
C It only shows contemporary sculptures.

13 What is the theme of Joe Tremain's 'burnt' sculptures?

A the contrast between nature and urban life
B the effect of man on the environment
C the violence of nature

14 The path by the Lower Lake

A is rather wet in some places.
B has recently been repaired.
C is difficult to walk on.

15 What does the speaker say about the Visitor Centre?

A It is being enlarged at present.
B It has received an international award.
C It was designed by a Canadian architect.

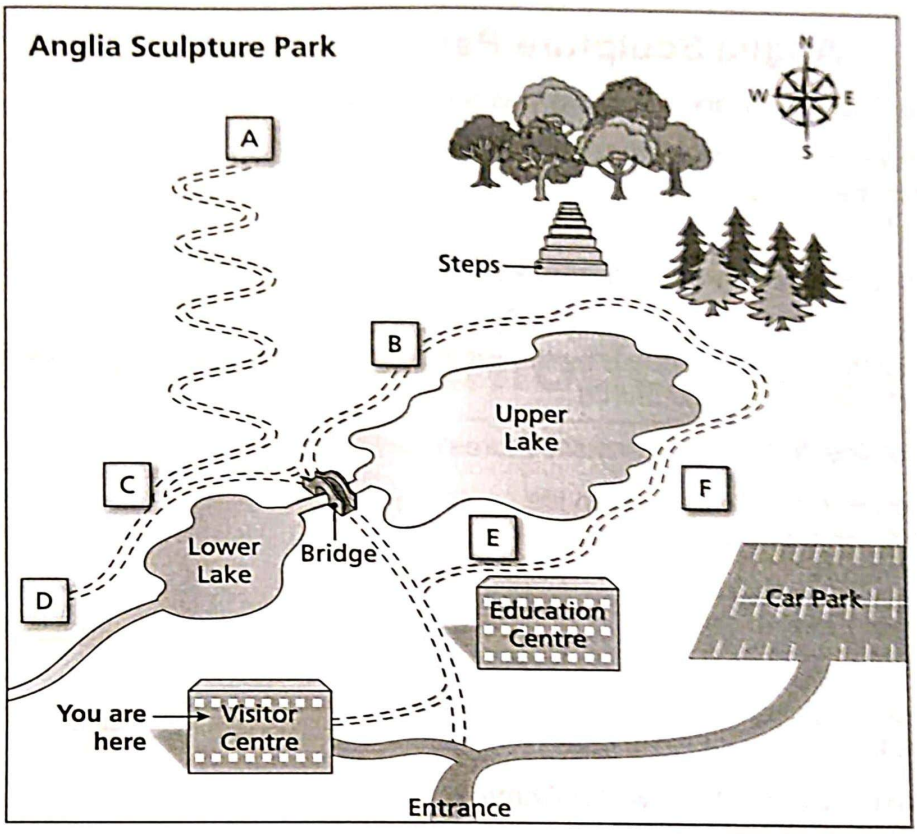
16 Today, visitors can buy snacks and sandwiches

A at the kiosk.
B in the Terrace Room.
C at the Lower Lake Café.

Questions 17–20

Label the map below.

*Write the correct letter, **A–F**, next to Questions 17–20.*



17 Joe Tremain sculptures

18 Giorgio Catalucci bird sculptures

19 Garden Gallery

20 Long House

PART 3 *Questions 21–30*

Questions 21–26

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

Marketing report

21 Why did Leo choose instant coffee as the topic for his marketing report?

- **A** He found plenty of material on the topic.
- **B** He had some practical experience in the area.
- **C** He had an idea of a brand he wanted to target.

22 Leo discovered that in Australia, recent technological developments

- **A** are producing less healthy types of instant coffee.
- **B** are reducing the demand for instant coffee.
- **C** are improving the quality of instant coffee.

23 What do the speakers agree about Leo's table of coffee products?

- **A** It needs more explanation in the text.
- **B** It is factually inaccurate in some places.
- **C** It would be best to put this in the appendix.

24 What do they decide about the description of Shaffers coffee as a market follower?

- **A** Leo needs to define his terms.
- **B** Leo needs to provide more evidence.
- **C** Leo needs to put it in a different section.

25 What does Anna say about originality in someone's first marketing report?

- **A** Clear analysis of data can be considered original.
- **B** Graphs and diagrams should be original, not copied.
- **C** Reports should contain some original data collected by the student.

26 What difference between his school assignments and this report has surprised Leo?

- **A** not knowing the criteria for getting a good mark
- **B** being required to produce work without assistance
- **C** having to do a great deal of research

Questions 27–30

Complete the notes below.

*Write **ONE WORD ONLY** for each answer.*

Notes on specific sections of marketing report

Executive summary

- Give a brief overview including the **27** .....

Problems

- Link each problem to a **28** ..... which explains it

Implementation

- Practical solutions to problems
- Include details such as participants, **29** ..... and sequence
- Section is often poorly done because of lack of **30** .....

Conclusion

- Don't use new material here

PART 4 *Questions 31–40*

Complete the notes below.

*Write **ONE WORD ONLY** for each answer.*

History of Fireworks in Europe

13th–16th centuries

- Fireworks were introduced from China.
- Their use was mainly to do with:
  - war
  - **31** ..... (in plays and festivals)

17th century

- Various features of **32** ..... were shown in fireworks displays.
- Scientists were interested in using ideas from fireworks displays:
  - to make human **33** ..... possible
  - to show the formation of **34** .....
- **London:**
  - Scientists were distrustful at first
  - Later, they investigated **35** ..... uses of fireworks (e.g. for sailors)
- **St Petersburg:**
  - Fireworks were seen as a method of **36** ..... for people
- **Paris:**
  - Displays emphasised the power of the **37** .....
  - Scientists aimed to provide **38** .....

18th century

- Italian fireworks specialists became influential.
- Servandoni's fireworks display followed the same pattern as an **39** ..... .
- The appeal of fireworks extended to the middle classes.
- Some displays demonstrated new scientific discoveries such as **40** ..... .

READING

READING PASSAGE 1

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

The Hidden Histories of Exploration Exhibition

A We have all heard tales of lone, heroic explorers, but what about the local individuals who guided and protected European explorers in many different parts of the globe? Or the go-betweens – including interpreters and traders – who translated the needs and demands of explorers into a language that locals could understand? Such questions have received surprisingly little attention in standard histories, where European explorers are usually the heroes, sometimes the villains. *The Hidden Histories of Exploration* exhibition at Britain's Royal Geographical Society in London sets out to present an alternative view, in which exploration is a fundamentally collective experience of work, involving many different people. Many of the most famous examples of explorers said to have been 'lone travellers' – say, Mungo Park or David Livingstone in Africa – were anything but 'alone' on their travels. They depended on local support of various kinds – for food, shelter, protection, information, guidance and solace – as well as on other resources from elsewhere.

B The Royal Geographical Society (RGS) seeks to record this story in its Hidden Histories project, using its astonishingly rich collections. The storage of geographical information was one of the main rationales for the foundation of the RGS in 1830, and the Society's collections now contain more than two million individual items, including books, manuscripts, maps, photographs, art-works, artefacts and film – a rich storehouse of material reflecting the wide geographical extent of British interest across the globe. In addition to their remarkable scope and range, these collections contain a striking visual record of exploration: the impulse to collect the world is reflected in a large and diverse image archive. For the researcher, this archive can yield many surprises: materials gathered for one purpose – say, maps relating to an international boundary dispute or photographs taken on a scientific expedition – may today be put to quite different uses.

C In their published narratives, European explorers rarely portrayed themselves as vulnerable or dependent on others, despite the fact that without this support they were quite literally lost. Archival research confirms that Europeans were not merely dependent on the work of porters, soldiers, translators, cooks, pilots, guides, hunters and collectors: they also relied on local expertise. Such assistance was essential in identifying potential dangers – poisonous species, unpredictable rivers, uncharted territories – which could mean the difference between life and death. The assistants themselves were

usually in a strong bargaining position. In the Amazon, for example, access to entire regions would depend on the willingness of local crew members and other assistants to enter areas inhabited by relatively powerful Amerindian groups. In an account of his journey across South America, published in 1836, William Smyth thus complained of frequent 'desertion' by his helpers: 'without them it was impossible to get on'.

D Those providing local support and information to explorers were themselves often not 'locals'. For example, the history of African exploration in the nineteenth century is dominated by the use of Zanzibar as a recruiting station for porters, soldiers and guides who would then travel thousands of miles across the continent. In some accounts, the leading African members of expedition parties – the 'officers' or 'foremen' – are identified, and their portraits published alongside those of European explorers.

E The information provided by locals and intermediaries was of potential importance to geographical science. How was this evidence judged? The formal procedures of scientific evaluation provided one framework. Alongside these were more 'common sense' notions of veracity and reliability, religiously-inspired judgments about the authenticity of testimony, and the routine procedures for cross-checking empirical observations developed in many professions.

F Given explorers' need for local information and support, it was in their interests to develop effective working partnerships with knowledgeable intermediaries who could act as brokers in their dealings with local inhabitants. Many of these people acquired far more experience of exploration than most Europeans could hope to attain. Some managed large groups of men and women, piloted the explorers' river craft, or undertook mapping work. The tradition was continued with the Everest expeditions in the 1920s and 1930s, which regularly employed the Tibetan interpreter Karma Paul. In Europe, exploration was increasingly thought of as a career; the same might be said of the non-Europeans on whom their expeditions depended.

G These individuals often forged close working relationships with European explorers. Such partnerships depended on mutual respect, though they were not always easy or intimate, as is particularly clear from the history of the Everest expeditions depicted in the Hidden Histories exhibition. The entire back wall is covered by an enlarged version of a single sheet of photographs of Sherpas taken during the 1936 Everest expedition. The document is a powerful reminder of the manpower on which European mountaineering expeditions depended, and also of the importance of local knowledge and assistance. Transformed from archive to wall display, it tells a powerful story through the medium of individual portraits – including Karma Paul, veteran of previous expeditions, and the young Tensing Norgay, 17 years before his successful 1953 ascent. This was a highly charged and transitional moment as the contribution of the Sherpas, depicted here with identity tags round their necks, was beginning to be much more widely recognised. These touching portraits encourage us to see them as agents rather than simply colonial subjects or paid employees. Here is a living history, which looks beyond what we already know about exploration: a larger history in which we come to recognise the contribution of everyone involved.

Questions 1–7

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

In boxes 1–7 on your answer sheet, write

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

1 The Hidden Histories of Exploration exhibition aims to show the wide range of people involved in expeditions.

2 The common belief about how Park and Livingstone travelled is accurate.

3 The RGS has organised a number of exhibitions since it was founded.

4 Some of the records in the RGS archives are more useful than others.

5 Materials owned by the RGS can be used in ways that were not originally intended.

6 In their publications, European explorers often describe their dependence on their helpers.

7 Local helpers refused to accompany William Smyth during parts of his journey.

Questions 8–13

Reading Passage 1 has seven paragraphs, **A–G**.

Which paragraph contains the following information?

*Write the correct letter, **A–G**, in boxes 8–13 on your answer sheet.*

8 reference to the distances that some non-European helpers travelled

9 description of a wide range of different types of documents

10 belief about the effect of an exhibition on people seeing it

11 examples of risks explorers might have been unaware of without local help

12 reference to various approaches to assessing data from local helpers

13 reference to people whose long-term occupation was to organise local assistance for European explorers

READING PASSAGE 2

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

Fatal Attraction

Evolutionist Charles Darwin first marvelled at flesh-eating plants in the mid-19th century. Today, biologists, using 21st-century tools to study cells and DNA, are beginning to understand how these plants hunt, eat and digest – and how such bizarre adaptations arose in the first place.

A The leaves of the Venus flytrap plant are covered in hairs. When an insect brushes against them, this triggers a tiny electric charge, which travels down tunnels in the leaf and opens up pores in the leaf's cell membranes. Water surges from the cells on the inside of the leaf to those on the outside, causing the leaf to rapidly flip in shape from convex to concave, like a soft contact lens. As the leaves flip, they snap together, trapping the insect in their sharp-toothed jaws.

B The bladderwort has an equally sophisticated way of setting its underwater trap. It pumps water out of tiny bag-like bladders, making a vacuum inside. When small creatures swim past, they bend the hairs on the bladder, causing a flap to open. The low pressure sucks water in, carrying the animal along with it. In one five-hundredth of a second, the door swings shut again. The Drosera sundew, meanwhile, has a thick, sweet liquid oozing from its leaves, which first attracts insects, then holds them fast before the leaves snap shut. Pitcher plants use yet another strategy, growing long tube-shaped leaves to imprison their prey. Raffles' pitcher plant, from the jungles of Borneo, produces nectar that both lures insects and forms a slick surface on which they can't get a grip. Insects that land on the rim of the pitcher slide on the liquid and tumble in.

C Many carnivorous plants secrete enzymes to penetrate the hard exoskeleton of insects so they can absorb nutrients from inside their prey. But the purple pitcher plant, which lives in bogs and infertile sandy soils in North America, enlists other organisms to process its food. It is home to an intricate food web of mosquito larvae, midges and bacteria, many of which can survive only in this unique habitat. These animals shred the prey that fall into the pitcher, and the smaller organisms feed on the debris. Finally, the plant absorbs the nutrients released.

D While such plants clearly thrive on being carnivorous, the benefits of eating flesh are not the ones you might expect. Carnivorous animals such as ourselves use the carbon in protein and the fat in meat to build muscles and store energy. Carnivorous plants instead draw nitrogen, phosphorus, and other critical nutrients from their prey in order to build light-harvesting enzymes. Eating animals, in other words, lets carnivorous plants do what all plants do: carry out photosynthesis, that is, grow by harnessing energy directly from the sun.

E Carnivorous plants are, in fact, very inefficient at converting sunlight into tissue. This is because of all the energy they expend to make the equipment to catch animals – the enzymes, the pumps, and so on. A pitcher or a flytrap cannot carry out much photosynthesis because, unlike plants with ordinary leaves, they do not

have flat solar panels that can grab lots of sunlight. There are, however, some special conditions in which the benefits of being carnivorous do outweigh the costs. The poor soil of bogs, for example, offers little nitrogen and phosphorus, so carnivorous plants enjoy an advantage over plants that obtain these nutrients by more conventional means. Bogs are also flooded with sunshine, so even an inefficient carnivorous plant can photosynthesise enough light to survive.

F Evolution has repeatedly made this trade-off. By comparing the DNA of carnivorous plants with other species, scientists have found that they evolved independently on at least six separate occasions. Some carnivorous plants that look nearly identical turn out to be only distantly related. The two kinds of pitcher plants – the tropical genus Nepenthes and the North American Sarracenia – have, surprisingly, evolved from different ancestors, although both grow deep pitcher-shaped leaves and employ the same strategy for capturing prey.

G In several cases, scientists can see how complex carnivorous plants evolved from simpler ones. Venus flytraps, for example, share an ancestor with Portuguese sundews, which only catch prey passively, via 'flypaper' glands on their stems. They share a more recent ancestor with Drosera sundews, which can also curl their leaves over their prey. Venus flytraps appear to have evolved an even more elaborate version of this kind of trap, complete with jaw-like leaves.

H Unfortunately, the adaptations that enable carnivorous plants to thrive in marginal habitats also make them exquisitely sensitive. Agricultural run-off and pollution from power plants are adding extra nitrogen to many bogs in North America. Carnivorous plants are so finely tuned to low levels of nitrogen that this extra fertilizer is overloading their systems, and they eventually burn themselves out and die.

I Humans also threaten carnivorous plants in other ways. The black market trade in exotic carnivorous plants is so vigorous now that botanists are keeping the location of some rare species a secret. But even if the poaching of carnivorous plants can be halted, they will continue to suffer from other assaults. In the pine savannah of North Carolina, the increasing suppression of fires is allowing other plants to grow too quickly and outcompete the flytraps in their native environment. Good news, perhaps, for flies. But a loss for all who, like Darwin, delight in the sheer inventiveness of evolution.

Questions 14–18

Complete the notes below.

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

Write your answers in boxes 14–18 on your answer sheet.

How a Venus flytrap traps an insect

- insect touches **14** ..... on leaf of plant
- small **15** ..... passes through leaf
- **16** ..... in cell membrane open
- outside cells of leaves fill with **17** .....
- leaves change so that they have a **18** ..... shape and snap shut

Questions 19–22

Look at the following statements (Questions 19–22) and the list of plants.

Match each statement with the correct plant, ***A, B, C, D*** *or* ***E.***

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

19 It uses other creatures to help it digest insects.

20 It produces a slippery substance to make insects fall inside it.

21 It creates an empty space into which insects are sucked.

22 It produces a sticky substance which traps insects on its surface.

List of plants

A	Venus flytrap
B	bladderwort
C	Drosera sundew
D	Raffles' pitcher plant
E	purple pitcher plant

Questions 23–26

Reading Passage 2 has nine paragraphs, **A–I**.

Which paragraph contains the following information?

*Write the correct letter, **A–I**, in boxes 23–26 on your answer sheet.*

23 a mention of a disadvantage of the leaf shape of some carnivorous plants

24 an example of an effort made to protect carnivorous plants

25 unexpected information about the origins of certain carnivorous plants

26 an example of environmental changes that shorten the life cycles of carnivorous plants

READING PASSAGE 3

You should spend about 20 minutes on ***Questions 27–40****, which are based on Reading Passage 3 on the following pages.*

Questions 27–32

Reading Passage 3 has seven paragraphs, **A–G**.

Choose the correct heading for paragraphs B–G from the list of headings below.

Write the correct number, ***i–x****, in boxes 27–32 on your answer sheet.*

List of Headings

i	A shift in our fact-finding habits
ii	How to be popular
iii	More personal information being known
iv	The origins of online social networks
v	The link between knowledge and influence
vi	Information that could change how you live
vii	The emotional benefits of online networking
viii	A change in how we view our online friendships
ix	The future of networking
x	Doubts about the value of online socialising

27 Paragraph **B**

28 Paragraph **C**

29 Paragraph **D**

30 Paragraph **E**

31 Paragraph **F**

32 Paragraph **G**

WANT TO BE FRIENDS?

Could the benefits of online social networking be too good to miss out on?

A For many hundreds of thousands of people worldwide, online networking has become enmeshed in our daily lives. However, it is a decades-old insight from a study of traditional social networks that best illuminates one of the most important aspects of today's online networking. In 1973 sociologist Mark Granovetter showed how the loose acquaintances, or 'weak ties', in our social network exert a disproportionate influence over our behaviour and choices. Granovetter's research showed that a significant percentage of people get their jobs as a result of recommendations or advice provided by a weak tie. Today our number of weak-tie contacts has exploded via online social networking. 'You couldn't maintain all of those weak ties on your own,' says Jennifer Golbeck of the University of Maryland. 'Online sites, such as Facebook, give you a way of cataloguing them.' The result? It's now significantly easier for the schoolfriend you haven't seen in years to pass you a tip that alters your behaviour, from recommendation of a low-cholesterol breakfast cereal to a party invite where you meet your future wife or husband.

B The explosion of weak ties could have profound consequences for our social structures too, according to Judith Donath of the Berkman Center for Internet and Society at Harvard University. 'We're already seeing changes,' she says. For example, many people now turn to their online social networks ahead of sources such as newspapers and television for trusted and relevant news or information. What they hear could well be inaccurate, but the change is happening nonetheless. If these huge 'supernets' – some of them numbering up to 5,000 people – continue to thrive and grow, they could fundamentally change the way we share information and transform our notions of relationships.

C But are these vast networks really that relevant to us on a personal level? Robin Dunbar, an evolutionary anthropologist at the University of Oxford, believes that our primate brains place a cap on the number of genuine social relationships we can actually cope with: roughly 150. According to Dunbar, online social networking appears to be very good for 'servicing' relationships, but not for establishing them. He argues that our evolutionary roots mean we still depend heavily on physical and face-to-face contact to be able to create ties.

D Nonetheless, there is evidence that online networking can transform our daily interactions. In an experiment at Cornell University, psychologist Jeff Hancock asked participants to try to encourage other participants to like them via instant messaging conversation. Beforehand, some members of the trial were allowed to view the Facebook profile of the person they were trying to win over. He found that those with Facebook access asked questions to which they already knew the answers or raised things they had in common, and as result were much more successful in their social relationships. Hancock concluded that people who use these sites to keep updated on the activities of their acquaintances are more likely to be liked in subsequent social interactions.

E Online social networking may also have tangible effects on our well-being. Nicole Ellison of Michigan State University found that the frequency of networking site use correlates with greater self-esteem. Support and affirmation from

the weak ties could be the explanation, says Ellison. 'Asking your close friends for help or advice is nothing new, but we are seeing a lowering of barriers among acquaintances,' she says. People are readily sharing personal feelings and experiences to a wider circle than they might once have done. Sandy Pentland at the Massachusetts Institute of Technology agrees. 'The ability to broadcast to our social group means we need never feel alone,' he says. 'The things that befall us are often due to a lack of social support. There's more of a safety net now.'

F Henry Holzman, also at MIT, who studies the interface between online social networking and the real world, points out that increased visibility also means our various social spheres – family, work, friends – are merging, and so we will have to prepare for new societal norms. 'We'll have to learn how to live a more transparent life,' he says. 'We may have to give up some ability to show very limited glimpses of ourselves to others.'

G Another way that online networking appears to be changing our social structures is through dominance. In one repeated experiment, Michael Kearns of the University of Pennsylvania asked 30 volunteers to quickly reach consensus in an online game over a choice between two colours. Each person was offered a cash reward if they succeeded in persuading the group to pick one or other colour. All participants could see the colour chosen by some of the other people, but certain participants had an extra advantage: the ability to see more of the participants' chosen colours than others. Every time Kearns found that those who could see the choices of more participants (in other words, were better connected) persuaded the group to pick their colour, even when they had to persuade the vast majority to give up their financial incentive. While Kearns warns that the setting was artificial, he says it's possible that greater persuasive power could lie with well-connected individuals in the everyday online world too.

Questions 33–36

Look at the following findings (Questions 33–36) and the list of researchers below.

*Match each finding with the correct researcher, **A–F**.*

*Write the correct letter, **A–F**, in boxes 33–36 on your answer sheet.*

33 People who network widely may be more able to exert pressure on others.

34 We have become more willing to confide in an extensive number of people.

35 There is a limit to how many meaningful relationships we can maintain.

36 There is a social advantage in knowing about the lives of our online contacts.

List of researchers

A	Mark Granovetter	**D**	Jeff Hancock
B	Judith Donath	**E**	Nicole Ellison
C	Robin Dunbar	**F**	Michael Kearns

Questions 37–40

*For Questions 37–40, choose **TWO** answers, **A–E**.*

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

37–38

*Which **TWO** of these advantages of online social networking are mentioned in Reading Passage 3?*

A Social networking sites can be accessed on any day and at any time.

B Online socialising is an efficient way of keeping in touch with a lot of people.

C It is very easy to establish new friendships online.

D Online social networking can solve problems in real-world relationships.

E It can be reassuring to be part of an online social network.

39–40

*Which **TWO** of these disadvantages of online social networking are mentioned in Reading Passage 3?*

A Information from online social contacts may be unreliable.

B We may become jealous of people who seem to have a wide circle of friends.

C We may lose the ability to relate to people face-to-face.

D It is easy to waste a lot of time on social networking sites.

E Using social networking sites may result in a lack of privacy.

Test 8

LISTENING

PART 1 *Questions 1–10*

Complete the notes below.

*Write **NO MORE THAN TWO WORDS AND/OR A NUMBER** for each answer.*

Hilary Lodge Retirement Home

Example

The name of the manager is Cathy

Activities programme involving volunteers

Monday evenings: computer training

- Training needed in how to produce **1** .....

Tuesday afternoons: singing

- The home has a **2** ..... and someone to play it

Thursday mornings: growing **3** .....

- The home doesn't have many **4** ..... for gardening

Once a month: meeting for volunteers and staff

Interview

- Go in on **5** ..... , any time
- Interview with assistant called **6** .....
- Address of home: 73 **7** ..... Road

'Open house' days

- Agreed to help on **8** .....
- Will show visitors where to **9** .....
- Possibility of talking to a **10** ..... reporter

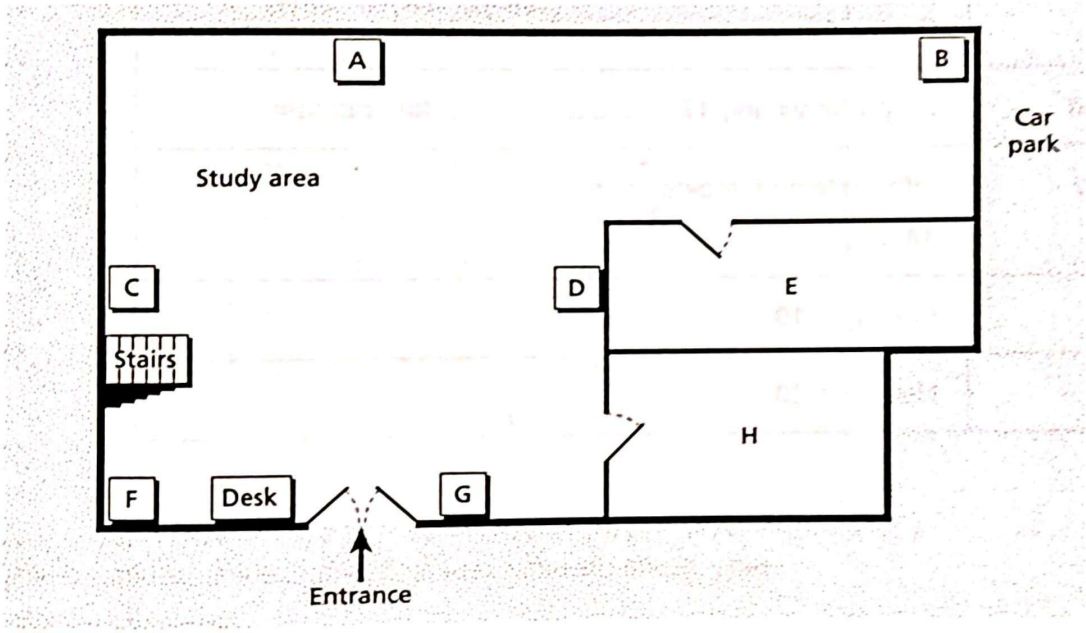
PART 2 *Questions 11–20*

Questions 11–15

Label the plan below.

*Write the correct letter, **A–H**, next to Questions 11–15.*

Plan of Learning Resource Centre (Ground Floor)



11 Newspapers .....

12 Computers .....

13 Photocopier .....

14 Café .....

15 Sports books .....

Questions 16–20

Complete the table below.

*Write **ONE WORD ONLY** for each answer.*

New staff responsibilities

Name	New responsibility
Jenny Reed	Buying **16** ..... for the Centre
Phil Penshurst	Help with writing **17** ..... for courses
Tom Salisbury	Information on topics related to the **18** .....
Saeed Aktar	Finding a **19** .....
Shilpa Desai	Help with **20** .....

PART 3 *Questions 21–30*

Questions 21–27

What helped Stewart with each of the following stages in making his training film for museum employees?

*Choose **SEVEN** answers from the box and write the correct letter, A–I, next to Questions 21–27.*

What helped Stewart	
A	advice from friends
B	information on a website
C	being allowed extra time
D	meeting a professional film maker
E	good weather conditions
F	getting a better computer
G	support of a manager
H	help from a family member
I	work on a previous assignment

Stages in making the training film for museum employees

21 finding a location .....

22 deciding on equipment .....

23 writing the script .....

24 casting .....

25 filming .....

26 editing .....

27 designing the DVD cover .....

Questions 28–30

Complete the notes below.

Write ***ONE WORD ONLY*** *for each answer.*

Stewart's work placement: benefits to the Central Museum Association

- his understanding of the Association's **28** .....
- the reduction in expense
- increased co-operation between **29** .....
- continuous **30** ..... which led to a better product
- ideas for distribution of the film

PART 4 *Questions 31–40*

Complete the notes below.

*Write **ONE WORD ONLY** for each answer.*

New Caledonian crows and the use of tools

Examples of animals using tools

- some chimpanzees use stones to break nuts
- Betty (New Caledonian crow) made a

  31 ..... out of wire to move a bucket of food
- Barney (New Caledonian crow) used sticks to find food

New Zealand and Oxford experiment

- three stages: crows needed to move a **32** ..... in order to reach a short stick; then use the short stick to reach a long stick; then use the long stick to reach food

Oxford research

- crows used sticks to investigate whether there was any **33** ..... from an object
- research was inspired by seeing crows using tools on a piece of cloth to investigate a spider design
- Barney used a stick to investigate a snake made of **34** .....
- Pierre used a stick to investigate a **35** .....
- Corbeau used a stick to investigate a metal toad
- the crows only used sticks for the first contact

Conclusions of above research

- ability to plan provides interesting evidence of the birds' cognition
- unclear whether this is evidence of the birds' **36** .....

Exeter and Oxford research in New Caledonia

- scientists have attached very small cameras to birds' **37** .....
- food in the form of beetle larvae provides plenty of **38** ..... for the birds
- larvae's specific **39** ..... composition can be identified in birds that feed on them
- scientists will analyse what the birds include in their **40** .....

READING

READING PASSAGE 1

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

The Phoenicians: an almost forgotten people

The Phoenicians inhabited the region of modern Lebanon and Syria from about 3000 BC. They became the greatest traders of the pre-classical world, and were the first people to establish a large colonial network. Both of these activities were based on seafaring, an ability the Phoenicians developed from the example of their maritime predecessors, the Minoans of Crete.

An Egyptian narrative of about 1080 BC, the *Story of Wen-Amen*, provides an insight into the scale of their trading activity. One of the characters is Wereket-El, a Phoenician merchant living at Tanis in Egypt's Nile delta. As many as 50 ships carry out his business, plying back and forth between the Nile and the Phoenician port of Sidon.

The most prosperous period for Phoenicia was the 10th century BC, when the surrounding region was stable. Hiram, the king of the Phoenician city of Tyre, was an ally and business partner of Solomon, King of Israel. For Solomon's temple in Jerusalem, Hiram provided craftsmen with particular skills that were needed for this major construction project. He also supplied materials – particularly timber, including cedar from the forests of Lebanon. And the two kings went into trade in partnership. They sent out Phoenician vessels on long expeditions (of up to three years for the return trip) to bring back gold, sandalwood, ivory, monkeys and peacocks from Ophir. This is an unidentified place, probably on the east coast of Africa or the west coast of India.

Phoenicia was famous for its luxury goods. The cedar wood was not only exported as top-quality timber for architecture and shipbuilding. It was also carved by the Phoenicians, and the same skill was adapted to even more precious work in ivory. The rare and expensive dye for cloth, Tyrian purple, complemented another famous local product, fine linen. The metalworkers of the region, particularly those working in gold, were famous. Tyre and Sidon were also known for their glass.

These were the main products which the Phoenicians exported. In addition, as traders and middlemen, they took a commission on a much greater range of precious goods that they transported from elsewhere.

The extensive trade of Phoenicia required much book-keeping and correspondence, and it was in the field of writing that the Phoenicians made their most lasting contribution to world history. The scripts in use in the world up to the second millennium BC (in Egypt, Mesopotamia or China) all required the writer to learn a large number of separate characters – each of them expressing either a whole word or an element of its meaning. By contrast, the Phoenicians, in about 1500 BC, developed an entirely new approach to writing. The marks made (with a pointed tool called a stylus, on damp clay) now attempted to capture the sound of a word. This required an alphabet of individual letters.

The trading and seafaring skills of the Phoenicians resulted in a network of colonies, spreading westwards through the Mediterranean. The first was probably Citium, in Cyprus, established in the 9th century BC. But the main expansion came from the 8th century BC onwards, when pressure from Assyria to the east disrupted the patterns of trade on the Phoenician coast.

Trading colonies were developed on the string of islands in the centre of the Mediterranean – Crete, Sicily, Malta, Sardinia, Ibiza – and also on the coast of north Africa. The African colonies clustered in particular around the great promontory which, with Sicily opposite, forms the narrowest channel on the main Mediterranean sea route. This is the site of Carthage.

Carthage was the largest of the towns founded by the Phoenicians on the north African coast, and it rapidly assumed a leading position among the neighbouring colonies. The traditional date of its founding is 814 BC, but archaeological evidence suggests that it was probably settled a little over a century later.

The subsequent spread and growth of Phoenician colonies in the western Mediterranean, and even out to the Atlantic coasts of Africa and Spain, was as much the achievement of Carthage as of the original Phoenician trading cities such as Tyre and Sidon. But no doubt links were maintained with the homeland, and new colonists continued to travel west.

From the 8th century BC, many of the coastal cities of Phoenicia came under the control of a succession of imperial powers, each of them defeated and replaced in the region by the next: first the Assyrians, then the Babylonians, Persians and Macedonian Greeks.

In 64 BC, the area of Phoenicia became part of the Roman province of Syria. The Phoenicians as an identifiable people then faded from history, merging into the populations of modern Lebanon and northern Syria.

Questions 1–8

Complete the sentences below.

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

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

The Phoenicians' trading activities

The Phoenicians' skill at **1** ..... helped them to trade.

In an ancient story, a **2** ..... from Phoenicia, who lived in Egypt, owned 50 ships.

A king of Israel built a **3** ..... using supplies from Phoenicia.

Phoenicia supplied Solomon with skilled **4** ..... .

The main material that Phoenicia sent to Israel was **5** ..... .

The kings of Phoenicia and Israel formed a business **6** ..... in order to carry out trade.

Phoenicians carved **7** ..... , as well as cedar.

The Phoenicians also earned a **8** ..... for shipping goods.

Questions 9–13

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

In boxes 9–13 on your answer sheet, write

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

9 Problems with Assyria led to the establishment of a number of Phoenician colonies.

10 Carthage was an enemy town which the Phoenicians won in battle.

11 Phoenicians reached the Atlantic ocean.

12 Parts of Phoenicia were conquered by a series of empires.

13 The Phoenicians welcomed Roman control of the area.

READING PASSAGE 2

*You should spend about 20 minutes on **Questions 14–26**, which are based on Reading Passage 2 on the following pages.*

Questions 14–19

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

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

*Write the correct number, **i–viii**, in boxes 14–19 on your answer sheet.*

List of Headings

- **i** The power within each studio
- **ii** The movie industry adapts to innovation
- **iii** Contrasts between cinema and other media of the time
- **iv** The value of studying Hollywood's Golden Age
- **v** Distinguishing themselves from the rest of the market
- **vi** A double attack on film studios' power
- **vii** Gaining control of the industry
- **viii** The top movies of Hollywood's Golden Age

14 Paragraph **A** .....

15 Paragraph **B** .....

16 Paragraph **C** .....

17 Paragraph **D** .....

18 Paragraph **E** .....

19 Paragraph **F** .....

The Hollywood Film Industry

A This chapter examines the 'Golden Age' of the Hollywood film studio system and explores how a particular kind of filmmaking developed during this period in US film history. It also focuses on the two key elements which influenced the emergence of the classic Hollywood studio system: the advent of sound and the business ideal of vertical integration. In addition to its historical interest, inspecting the growth of the studio system may offer clues regarding the kinds of struggles that accompany the growth of any new medium. It might, in fact, be intriguing to examine which changes occurred during the growth of the Hollywood studio, and compare those changes to contemporary struggles in which production companies are trying to define and control emerging industries, such as online film and interactive television.

B The shift of the industry away from 'silent' films began during the late 1920s. Warner Bros.' 1927 film *The Jazz Singer* was the first to feature synchronized speech, and with it came a period of turmoil for the industry. Studios now had proof that 'talkie' films would make them money, but the financial investment this kind of filmmaking would require, from new camera equipment to new projection facilities, made the studios hesitant to invest at first. In the end, the power of cinematic sound to both move audiences and enhance the story persuaded studios that talkies were worth investing in. Overall, the use of sound in film was well-received by audiences, but there were still many technical factors to consider. Although full integration of sound into movies was complete by 1930, it would take somewhat longer for them to regain their stylistic elegance and dexterity. The camera now had to be encased in a big, clumsy, unmoveable soundproof box. In addition, actors struggled, having to direct their speech to awkwardly-hidden microphones in huge plants, telephones or even costumes.

C Vertical integration is the other key component in the rise of the Hollywood studio system. The major studios realized they could increase their profits by handling each stage of a film's life: production (making the film), distribution (getting the film out to people) and exhibition (owning the theaters in major cities where films were shown first). Five studios, 'The Big Five', worked to achieve vertical integration through the late 1940s, owning vast real estate on which to construct elaborate sets. In addition, these studios set the exact terms of films' release dates and patterns. Warner Bros., Paramount, 20th Century Fox, MGM and RKO formed this exclusive club. 'The Little Three' studios – Universal, Columbia and United Artists – also made pictures, but each lacked one of the crucial elements of vertical integration. Together these eight companies operated as a mature oligopoly, essentially running the entire market.

D During the Golden Age, the studios were remarkably consistent and stable enterprises, due in large part to long-term management heads – the infamous 'movie moguls' who ruled their kingdoms with iron fists. At MGM, Warner Bros. and Columbia, the same men ran their studios for decades. The rise of the studio system also hinges on the treatment of stars, who were constructed and exploited to suit a studio's image and schedule. Actors were bound up in seven-year contracts to a single studio, and the studio boss generally held all the options. Stars could be loaned out to other production companies at any time. Studio bosses could also force bad roles on actors, and manipulate every single detail of stars' images with their mammoth in-house publicity departments. Some have compared the Hollywood studio system to a factory, and it is useful to remember that studios were out to make money first and art second.

E On the other hand, studios also had to cultivate flexibility, in addition to consistent factory output. Studio heads realized that they couldn't make virtually the same film over and over again with the same cast of stars and still expect to keep turning a profit. They also had to create product differentiation. Examining how each production company tried to differentiate itself has led to loose characterizations of individual studios' styles. MGM tended to put out a lot of all-star productions while Paramount excelled in comedy and Warner Bros. developed a reputation for gritty social realism. 20th Century Fox forged the musical and a great deal of prestige biographies, while Universal specialized in classic horror movies.

F In 1948, struggling independent movie producers and exhibitors finally triumphed in their battle against the big studios' monopolistic behavior. In the United States versus Paramount federal decree of that year, the studios were ordered to give up their theaters in what is commonly referred to as 'divestiture' – opening the market to smaller producers. This, coupled with the advent of television in the 1950s, seriously compromised the studio system's influence and profits. Hence, 1930 and 1948 are generally considered bookends to Hollywood's Golden Age.

Questions 20–23

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

In boxes 20–23 on your answer sheet, write

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

20 After *The Jazz Singer* came out, other studios immediately began making movies with synchronized sound.

21 There were some drawbacks to recording movie actors' voices in the early 1930s.

22 There was intense competition between actors for contracts with the leading studios.

23 Studios had total control over how their actors were perceived by the public.

Questions 24–26

Complete the summary below.

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

Write your answers in boxes 24–26 on your answer sheet.

THE HOLLYWOOD STUDIOS

Throughout its Golden Age, the Hollywood movie industry was controlled by a handful of studios. Using a system known as **24** ..... , the biggest studios not only made movies, but handled their distribution and then finally showed them in their own theaters. These studios were often run by autocratic bosses – men known as **25** ..... , who often remained at the head of organisations for decades. However, the domination of the industry by the leading studios came to an end in 1948, when they were forced to open the market to smaller producers – a process known as **26** ..... .

READING PASSAGE 3

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

Left or right?

An overview of some research into lateralisation: the dominance of one side of the body over the other

A Creatures across the animal kingdom have a preference for one foot, eye or even antenna. The cause of this trait, called lateralisation, is fairly simple: one side of the brain, which generally controls the opposite side of the body, is more dominant than the other when processing certain tasks. This does, on some occasions, let the animal down: such as when a toad fails to escape from a snake approaching from the right, just because its right eye is worse at spotting danger than its left. So why would animals evolve a characteristic that seems to endanger them?

B For many years it was assumed that lateralisation was a uniquely human trait, but this notion rapidly fell apart as researchers started uncovering evidence of lateralisation in all sorts of animals. For example, in the 1970s, Lesley Rogers, now at the University of New England in Australia, was studying memory and learning in chicks. She had been injecting a chemical into chicks' brains to stop them learning how to spot grains of food among distracting pebbles, and was surprised to observe that the chemical only worked when applied to the left hemisphere of the brain. That strongly suggested that the right side of the chick's brain played little or no role in the learning of such behaviours. Similar evidence appeared in songbirds and rats around the same time, and since then, researchers have built up an impressive catalogue of animal lateralisation.

C In some animals, lateralisation is simply a preference for a single paw or foot, while in others it appears in more general patterns of behaviour. The left side of most vertebrate brains, for example, seems to process and control feeding. Since the left hemisphere processes input from the right side of the body, that means animals as diverse as fish, toads and birds are more likely to attack prey or food items viewed with their right eye. Even humpback whales prefer to use the right side of their jaws to scrape sand eels from the ocean floor.

D Genetics plays a part in determining lateralisation, but environmental factors have an impact too. Rogers found that a chick's lateralisation depends on whether it is exposed to light before hatching from its egg – if it is kept in the dark during this period, neither hemisphere becomes dominant. In 2004, Rogers used this observation to test the advantages of brain bias in chicks faced with the challenge of multitasking. She hatched chicks with either strong or weak lateralisation, then presented the two groups with food hidden among small pebbles and the threatening shape of a fake predator flying overhead. As predicted, the birds incubated in the light looked for food mainly with their right eye, while using the other to check out the predator. The weakly-lateralised chicks, meanwhile, had difficulty performing these two activities simultaneously.

E Similar results probably hold true for many other animals. In 2006, Angelo Bisazza at the University of Padua set out to observe the differences in feeding behaviour between strongly-lateralised and weakly-lateralised fish. He found that strongly-lateralised individuals were able to feed twice as fast as weakly-lateralised ones when there was a threat of a predator looming above them. Assigning different jobs to different brain halves may be especially advantageous for animals such as birds or fish, whose eyes are placed on the sides of their heads. This enables them to process input from each side separately, with different tasks in mind.

F And what of those animals who favour a specific side for almost all tasks? In 2009, Maria Magat and Culum Brown at Macquarie University in Australia wanted to see if there was general cognitive advantage in lateralisation. To investigate, they turned to parrots, which can be either strongly right- or left-footed, or ambidextrous (without dominance). The parrots were given the intellectually demanding task of pulling a snack on a string up to their beaks, using a co-ordinated combination of claws and beak. The results showed that the parrots with the strongest foot preferences worked out the puzzle far more quickly than their ambidextrous peers.

G A further puzzle is why are there always a few exceptions, like left-handed humans, who are wired differently from the majority of the population? Giorgio Vallortigara and Stefano Ghirlanda of Stockholm University seem to have found the answer via mathematical models. These have shown that a group of fish is likely to survive a shark attack with the fewest casualties if the majority turn together in one direction while a very small proportion of the group escape in the direction that the predator is not expecting.

H This imbalance of lateralisation within populations may also have advantages for individuals. Whereas most co-operative interactions require participants to react similarly, there are some situations – such as aggressive interactions – where it can benefit an individual to launch an attack from an unexpected quarter. Perhaps this can partly explain the existence of left-handers in human societies. It has been suggested that when it comes to hand-to-hand fighting, left-handers may have the advantage over the right-handed majority. Where survival depends on the element of surprise, it may indeed pay to be different.

Questions 27–30

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

*Write the correct letter, **A–F**, in boxes 27–30 on your answer sheet.*

27 In the 1970s, Lesley Rogers discovered that

28 Angelo Bisazza's experiments revealed that

29 Magat and Brown's studies show that

30 Vallortigara and Ghirlanda's research findings suggest that

A lateralisation is more common in some species than in others.

B it benefits a population if some members have a different lateralisation than the majority.

C lateralisation helps animals do two things at the same time.

D lateralisation is not confined to human beings.

E the greater an animal's lateralisation, the better it is at problem-solving.

F strong lateralisation may sometimes put groups of animals in danger.

Questions 31–35

Complete the summary below.

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

Write your answers in boxes 31–35 on your answer sheet.

Lesley Rogers' 2004 Experiment

Lateralisation is determined by both genetic and **31** ..... influences. Rogers found that chicks whose eggs are given **32** ..... during the incubation period tend to have a stronger lateralisation. Her 2004 experiment set out to prove that these chicks were better at **33** ..... than weakly lateralised chicks. As expected, the strongly lateralised birds in the experiment were more able to locate **34** ..... using their right eye, while using their left eye to monitor an imitation **35** ..... located above them.

Questions 36–40

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

Which paragraph contains the following information?

Write the correct letter, ***A–H****, in boxes 36–40 on your answer sheet.*

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

36 description of a study which supports another scientist's findings

37 the suggestion that a person could gain from having an opposing lateralisation to most of the population

38 reference to the large amount of knowledge of animal lateralisation that has accumulated

39 research findings that were among the first to contradict a previous belief

40 a suggestion that lateralisation would seem to disadvantage animals