READING AND USE OF ENGLISH (1 hour 15 minutes)

Part 1

For questions **1–8**, read the text below and decide which answer (**A**, **B**, **C** or **D**) best fits each gap. There is an example at the beginning (**0**).

Mark your answers **on the separate answer sheet**.

Example:

0 **A** open **B** think **C** find **D** look

0	A	B	C	D
	▭	▭	▬	▭

The importance of science

The aim of science is to **(0)** ..... out how the world and everything in it, and beyond it, works. Some people, though, **(1)** ..... that much of what is done in the name of science is a waste of time and money. What is the **(2)** ..... in investigating how atoms behave or in studying stars billions of kilometres away? Science, they argue, is of **(3)** ..... only if it has some practical use.

When the Scottish scientist James Clerk Maxwell **(4)** ..... experiments with electricity and magnetism in the late 19th century, he had no particular end in **(5)** ..... and was certainly not **(6)** ..... to make money; he was simply trying to reveal more about how the world works. And yet his work laid the **(7)** ..... for our modern way of life. Computers, the internet, satellites, mobile phones, televisions, medical scanners all owe their existence to the fact that a scientist **(8)** ..... the need to understand the world a little better.

1	**A** claim	**B** demand	**C** tell	**D** review
2	**A** basis	**B** cause	**C** point	**D** sake
3	**A** gain	**B** profit	**C** advantage	**D** value
4	**A** brought on	**B** carried out	**C** pulled out	**D** set off
5	**A** plan	**B** idea	**C** mind	**D** thought
6	**A** reaching	**B** aiming	**C** targeting	**D** designing
7	**A** sources	**B** origins	**C** structures	**D** foundations
8	**A** held	**B** felt	**C** chose	**D** used

LIVEWORKSHEETS

Part 2

For questions **9–16**, read the text below and think of the word which best fits each gap. Use only **one** word in each gap. There is an example at the beginning (**0**).

Write your answers **IN CAPITAL LETTERS on the separate answer sheet.**

Example: 0 | O | F | | | | | | | | | | | | | | |

Food preservation

Keeping food for long periods **(0)** ..... time was historically a huge problem. This proved especially crucial **(9)** ..... times when agricultural production **(10)** ..... severely limited by weather or crop failure. People commonly used ice to keep food fresh but, of **(11)** ..... , ice itself melts relatively quickly. In 1859 an American, John Mason, invented a glass jar with a metal screw-on lid, creating a perfect seal and making **(12)** ..... possible to preserve food that would previously not have remained edible. Mason's jar is still **(13)** ..... use throughout the world.

An even **(14)** ..... successful method for keeping food by canning it in metal containers was perfected between 1870 **(15)** ..... 1920 by Englishman Bryan Donkin. This preserved food beautifully, though the early iron cans were expensive, heavy and difficult to open. A breakthrough came in the 1880s with the development of lighter materials **(16)** ..... also enabled mass production of cans.

Part 3

For questions **17–24**, read the text below. Use the word given in capitals at the end of some of the lines to form a word that fits in the gap **in the same line**. There is an example at the beginning (**0**).

Write your answers **IN CAPITAL LETTERS on the separate answer sheet.**

Example: 0 | P | A | R | T | I | C | U | L | A | R | L | Y | | | | | |

Enjoying travel

I always enjoy travelling, **(0)** ..... when it means visiting other countries. One of the clearest memories from my childhood is of going to Disneyworld. Some people disapprove of the place but I loved it as a child and found it just as **(17)** ..... when I returned years later as an adult. **PARTICULAR** **ENJOY**

I am **(18)** ..... that my work involves a lot of travel. The two places I visit most often are Barcelona and New York. I like both, but there is a tremendous **(19)** ..... between them. Barcelona is relaxed and overflowing with culture. New York, though, is bustling and full of **(20)** ..... . When I'm there I'm constantly looking upwards, overwhelmed by the **(21)** ..... of the buildings. It is quite **(22)** ..... anywhere else I've ever been. **FORTUNE** **DIFFERENT** **EXCITE** **HIGH** **LIKE**

I went to Tokyo last year and found it absolutely fascinating. However, my top **(23)** ..... for a city break has to be Toronto; it is visually **(24)** ..... and I've had some of the best meals I've ever eaten there. **CHOOSE** **SPECTACLE**

LIVEWORKSHEETS

Part 4

For questions **25–30**, complete the second sentence so that it has a similar meaning to the first sentence, using the word given. **Do not change the word given**. You must use between **two** and **five** words, including the word given. Here is an example (**0**).

Example:

0 A very friendly taxi driver drove us into town.

DRIVEN

We ..... a very friendly taxi driver.

The gap can be filled by the words 'were driven into town by', so you write:

Example:	0	*WERE DRIVEN INTO TOWN BY*

Write **only** the missing words **IN CAPITAL LETTERS on the separate answer sheet.**

25 Everyone apart from John thought that Lisa would get the job.

PERSON

John was ..... not expect Lisa to get the job.

26 I'm concerned about whether I'll be able to finish the project on time.

CONCERNS

What ..... whether I'll be able to finish the project on time.

27 We had to leave the lecture early or we would have missed the last bus.

UNTIL

If we ..... of the lecture, we would have missed the last bus.

28 The number of students going to university went up last year.

INCREASE

There ..... the number of students going to university last year.

29 I'll phone you tonight so you can tell me what you've been doing.

CATCH

I'll phone you tonight to ..... news.

30 That was one of the best meals I've had this year.

AS

I've had very ..... that one this year.

LIVEWORKSHEETS

Part 5

You are going to read an article about a wildlife cameraman called Doug Allan. For questions **31–36**, choose the answer (**A**, **B**, **C** or **D**) which you think fits best according to the text.

Mark your answers **on the separate answer sheet.**

Wildlife cameraman

Doug Allan films wild animals in cold places. If you've ever been amazed by footage of polar bears in a nature documentary, it's probably been filmed by him. His perfect temperature, he says, is -18°C. Allan trained as a marine biologist and commercial diver. Diving was his first passion, where he learned about survival in cold places. His big break came when a TV crew turned up in Antarctica, where Allan was working, to film a wildlife documentary. 'I ended up taking the crew to different places, and after 48 hours I realised that being a wildlife cameraman ticked all the boxes: travel, adventure, underwater.'

He is now a top cameraman and has worked on many major TV wildlife series. 'I came along at a good time. When I started, hardly anyone had been to the Antarctic. You had coral people, elephant people, chimpanzee people. I just became the cold man. It was like all these amazing sequences were just waiting to be captured on film.' The camera and communications technology was very basic when he started 35 years ago. 'It is certainly easier to film today. If you shot something then, you had to remember it. Today, with digital technology, you can shoot a lot and look at it immediately. You used to have to think what shots you needed next, and what you had missed. You shot less. Film was very expensive. Today you can have too much material.'

'My value is field experience in cold conditions. I have a feel for it. I have spent so much time on sea ice it now feels like crossing the street. I do get cold toes but the poles are healthy places. There are no leeches, no diseases or mosquitoes.' Wildlife filming, Allan says, is full of great successes, but also failures and embarrassments. Once, he was in the Orkneys to film kittiwakes. Unfortunately he could not identify which birds they were.

When Allan recently got permission to film sequences for a major TV series in Kong Karls Land, a group of islands in the Arctic Ocean, he did not expect an easy assignment. It is a world of polar bears and is strictly off limits to all but the most fearless or foolish. Usually -32°C in April, the wind is vicious and hauling cameras in the deep snow is a nightmare. After walking five or more hours a day and watching polar bear dens in the snow slopes for 23 days, however, Allan had seen just one mother bear and her cub. By day 24, though, he says, he was living in bear world, at bear speed, with bear senses.

'We find a new hole and wait. We shuffle, hop, bend, stretch and run to stay warm. Five hours of watching and then with no warning at all I catch a glimpse so brief that I almost miss it. But the camera's locked on the hole on full zoom and my eye's very quickly on the viewfinder. Nothing for a couple of seconds and then an unmistakable black nose. Nose becomes muzzle, grows bigger to become full head and in less than a minute she has her front legs out and is resting on the snow in front of the hole. She's looking at me but she's not bothered. I've just taken a close-up, thinking this can't get much better ... when she sets off on a long slide down the slope. I'd swear it's partly in sheer pleasure,' he recounts, adding that two cubs then appeared at the den entrance. 'Clearly it's their first view of the world ... It's show time on the slopes and we have front-row seats.'

Now Allan would like to make his own film about climate change in the Arctic, talking to the people who live there and experience the impact of it first hand. He says he would be able to make an extraordinary documentary. *line 80*

31 What do we learn about Allan in the first paragraph?

- **A** He had to train as a diver in order to become a wildlife cameraman.
- **B** Becoming a cameraman suited the interests he already had.
- **C** He was given the chance to work as a cameraman by a TV crew he met.
- **D** Finding work as a cameraman allowed him to remain in Antarctica.

32 What does Allan say about the first documentaries he worked on?

- **A** He has very clear memories of them.
- **B** Most of what he filmed was new to viewers.
- **C** They were shorter than those he makes nowadays.
- **D** He would have liked to have been able to choose where he worked.

33 Why does Allan compare spending time on sea ice to crossing the street?

- **A** It is an ordinary occurrence for him.
- **B** He thinks it presents a similar level of danger.
- **C** He has learnt to approach it in the same way.
- **D** It requires skills that can be used in winter conditions anywhere.

34 When Allan had been on Kong Karls Land for a while, he began to

- **A** stop worrying about the dangers he was facing.
- **B** feel a deep understanding of how polar bears lived.
- **C** get used to the terrible conditions for filming.
- **D** be more hopeful that one bear would lead him to others.

35 What feeling does Allan describe in the fifth paragraph?

- **A** panic when he nearly fails to film a fantastic sequence
- **B** concern that he has disturbed an adult female with her young
- **C** amazement at being lucky enough to capture some great shots
- **D** delight at being able to move around after waiting quietly for ages

36 What does *it* refer to in line 80?

- **A** Allan's film
- **B** climate change
- **C** the Arctic
- **D** living there

LIVEWORKSHEETS

Part 6

You are going to read an article about how the Egyptian pyramids were built. Six sentences have been removed from the article. Choose from the sentences **A–G** the one which fits each gap **(37–42)**. There is one extra sentence which you do not need to use.

Mark your answers **on the separate answer sheet.**

Has one of the mysteries of the ancient pyramids been solved?

A painting in a 3000-year-old tomb suggests how the Ancient Egyptians may have transported the heavy stones used to build the pyramids.

Ever since the discovery of the first pyramid, scientists have wondered how ancient Egyptians built these monumental structures that are visible even from space.

There are a number of theories about the construction techniques they used. [37] Egyptologists had always wondered how workers were able to move the giant limestone blocks. These weigh as much as 2.5 tons each, and the stone quarries from which they were cut were often located hundreds of kilometres away from the pyramid sites.

Dragging them on basic wooden sledges, similar to those people use to slide down snow-covered slopes in winter, was the obvious answer. [38] It now turns out that the workers probably did have some assistance – from ordinary water! What is even more amazing is that the answer to the Egyptologists' puzzle has been staring them in the face for many years, in a wall painting in the tomb of an ancient Egyptian king, or pharaoh.

The artwork, which depicts a pharaoh being pulled along by a large team of workers, has one significant detail that had so far been misinterpreted – a man pouring water in front of the sledge the pharaoh is being dragged upon. Egyptologists had always thought that the man was performing some kind of religious ritual. However, some scientists now believe that the water was being poured for a totally different reason. [39]

This revelation was made by researchers from the University of Amsterdam and the Foundation for Fundamental Research on Matter. The scientists arrived at this conclusion after conducting extensive testing in their laboratory, by sliding a weighted tray across both dry sand and sand that had been mixed with varying amounts of water. In dry sand, heaps formed in front of the tray as it was dragged along. [40]

However, as the researchers added water, the sand hardened, which helped reduce both the force needed to pull the tray and the friction against it. That's because the water helps form tiny water bridges, known as capillary bridges, between the sand particles, causing them to stick together. [41] The force required to pull the sledge would have been reduced by as much as 50% as the sand became stiffer, which meant that half as many workers were needed to move the heavy stones.

There was a tipping point, though. After the moisture exceeded a certain amount, the stiffness started to decrease and the capillary bridges melted away, causing the sand to clump up around the tray once again. According to the researchers, the perfect balance appears to be when the volume of the water is between 2 – 5% of the volume of sand. [42] And so another step has been taken towards understanding the incredible feat achieved by these ancient engineers. Now if we could only find a painting that would tell us how the workers erected these impressive structures without access to modern mechanics, that would be amazing!

A However, to do so would have required superhuman strength against the friction of the desert sand.

B This allowed them to work out exactly how much of it had been used every time.

C This slowed it down dramatically.

D One question, however, had been left unanswered.

E The pyramid builders seem to have realised that this was the correct proportion.

F The effect of this turns out to be significant.

G It was to help the sledge move more easily across the sand.

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Part 7

You are going to read four reviews of books about sleep and dreams. For questions **43–52**, choose from the reviews (**A–D**). The reviews may be chosen more than once.

Mark your answers **on the separate answer sheet.**

Which review

emphasises how enjoyable sleep is?	43
says certain aspects of our lives are becoming less distinct from one another?	44
points out that many people share a mistaken belief?	45
describes the structure of the book?	46
explains why we have certain experiences?	47
mentions a practical problem faced by scientists?	48
says the book shows that major developments have occurred in a field?	49
says the writer deals with issues that cause debate?	50
comments that our lack of knowledge regarding sleep is surprising?	51
says the reader learns how a technological advance caused problems?	52

Four books about sleep

A Sleepfaring

Why do we sleep? Are we sleeping enough? How can we tackle sleep problems? Jim Horne finds answers to these questions and many more in *Sleepfaring*, a journey through the science and the secrets of sleep. He reveals what goes on in our brains during sleep, and also gives some hints from the latest sleep research that may just help you get a better night's rest. In recent years, understanding sleep has become increasingly important, as people work longer hours, styles of working have altered, and the separation between workplace and home is being reduced by cell phones and the internet. Horne draws on the latest research to reveal what science has discovered about sleep. Nor does Horne avoid controversial topics; challenging, for example, the conventional wisdom on the amount of sleep we actually need. For anyone wishing to know more about the many mysterious processes that begin when we close our eyes each night, *Sleepfaring* offers a wealth of insight and information.

B Dreaming

What is dreaming? Why are dreams so strange and why are they so hard to remember? In this fascinating book, Harvard researcher Ailan Hobson offers an intriguing look at our nightly journey through the world of dreams. He describes how the theory of dreaming has advanced dramatically. We have learned that, in dreaming, some areas of the brain are very active – the visual and auditory centres, for instance – while others are completely shut down, including the centres for self-awareness, logic, and memory. Thus we can have visually vivid dreams, but be utterly unaware that the sequence of events or localities may be bizarre and, quite often, impossible. And because the memory centre is inactive, we don't remember the dream at all, unless we wake up while it is in progress. With special boxed features that highlight intriguing questions – Do we dream in colour? (yes), Do animals dream? (probably) – *Dreaming* offers a cutting-edge account of the most mysterious area of our mental life.

C Counting Sheep

Even though we will devote a third of our lives to sleep, we still know remarkably little about its origins and purpose. Does getting up early really benefit us? Can some people really exist on just a few hours' sleep a night? Does everybody dream? Do fish dream? How did people cope before alarm clocks and caffeine? And is anybody getting enough sleep? Paul Martin's *Counting Sheep* answers these questions and more in this illuminating work of popular science. Even the wonders of yawning are explained in full. To sleep, to dream: *Counting Sheep* reflects the centrality of these activities to our lives and can help readers respect, understand, and appreciate that delicious time when they're lost to the world.

D Dreamland

Reporter Randall provides a brisk tour of sleep research and what it means for individuals hoping to feel well rested. The author engaged with sleep research in part because of his sleepwalking. Researching the world of sleep is obviously difficult because sleeping subjects selected for studies rarely remember anything specific. Nonetheless, Randall interviewed sleep researchers and read academic papers to learn what he could from those who devote their careers to the science of sleep. The book is not a continuous narrative but rather a loose progression of chapters about different sleep-related issues. For example, Randall explains how the invention of electricity led to countless cases of sleep deprivation; the lack of utter darkness after sunset is often the enemy of sound sleep. He also emphasises the too-often neglected common-sense realisation that sleep is no void; rather, it is perhaps one third of the puzzle of living well.

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