

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 H A V I N G

Are You Happy Where You Work?

Finding a job you love is the first step to being happy at work, but (0) the right workplace environment is equally important. Creativity, hard work and bright ideas come (9) positive, happy working environments in (10) people are allowed the freedom to think, develop and express themselves. It's important for everyone to have (11) own clearly-defined work space, even if the workplace adopts an 'open plan' style, as so many offices now (12) Relaxation areas where people meet to chat and discuss ideas during office hours are regarded (13) particularly beneficial.

Adding plants to the working environment can also (14) offices to life, since they increase oxygen levels, purify the air and can create a calming and more productive environment. Finally, the lighting (15) be right, because it can have a huge effect on people's moods. If offices are too harshly lit, (16) can result in anger and headaches and lead to a lack of concentration.

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 A B I L I T Y

Camels in the Arctic?

Camels are well known for their (0) to survive the heat of the desert; however, scientists have unearthed the fossilised remains of a giant camel that (17) the forests of the High Arctic more than three million years ago. The ancient beast was almost three metres in (18) , about a third bigger than its modern (19) , the Arabian camel. Remains of the animal were found on Ellesmere Island, the most northerly and (20) island of the Canadian Arctic archipelago.

(21) from previous expeditions have shown that the camel's ancestors (22) in North America 45 million years ago, but this is the first evidence of camels so far north. According to Mike Buckley, a researcher who studied the latest remains, this ancestor of modern camels may already have developed some of the (23) that helped it survive in harsh climates – the hump for fat (24) for instance, the large flat feet ideal for either snow or sand, and the big eyes that perhaps helped when long, dark winters made visibility poor.

ABLE

HABIT

HIGH

DESCEND

MOUNTAIN

FIND

ORIGIN

ADAPT

STORE

Part 6

You are going to read extracts from four articles in which museum directors give their views on museums. For questions 37–40, choose from the extracts A–D. The museum directors may be chosen more than once.

Mark your answers on the separate answer sheet.

Museums

- A** Statistics show that museums are going from strength to strength in terms of visitor numbers, which is an encouraging sign in our computer-obsessed society. Online access increasingly rules how we approach information today, and museums have to engage with this to stay relevant. That said, a picture on a screen cannot replace material engagement with an object. Unfortunately, many people still have rather outdated ideas of what museums are like, including believing that they are high-brow institutions aimed at some international elite, which is clearly no longer the case, particularly with the smaller ones. With effort, a museum can be the heart of a community, preserving the stories which are important to those who live nearby, and I know of many such museums all over the country which are thriving.
- B** It is interesting that people who do not think twice about visiting a museum when on holiday very rarely set foot in one the rest of the time, but this is nothing to do with a failure to accommodate a wide range of people – museums definitely do that nowadays. I think it is more that, when we are entrenched in our daily routine, museums are not high on our list of priorities. Breaking out of that routine gives you the opportunity to do different things, among them things like visiting museums. Part of the appeal of museums, of course, is the chance to view objects from around the world and get a taste of another culture. Although there are rigorous export controls stopping objects of national significance being sold abroad, thanks to the internet museums can co-operate to arrange reciprocal loans for special exhibitions.
- C** Museums are clearly keen to capitalise on the possibilities offered by the internet, and it is a valuable tool for extending access. Exhibitions can remain on view on our website indefinitely after a physical show has been dismantled, and people have the opportunity to examine fascinating artefacts and works of art from all corners of the globe in much greater detail than they can in the gallery. The only downside of the increasing expectation of online access that I can see, is that provincial museums lose out to the large nationals, as their more limited resources mean they cannot hope to compete. I am convinced that this is what is behind their falling visitor numbers. Having said that, on a national level, more people feel that museums are relevant to everyone, rather than just a select few, and this has clearly made a difference.
- D** I would love to think that people come through the door of institutions such as mine because they want to open their minds to new things, but, while that may be true of a few, I know that the majority are visitors to the city who are including one or two museums in their itinerary in order to add variety. Having said that, I really hope that they leave with a wish to come back, or to try other museums. I also think there is still a long way to go in terms of winning over visitors from less privileged backgrounds. In this age of fast-changing, user-friendly digital technology, many people feel intimidated by the rather dry, academic way in which many still display their exhibits. We are now working a great deal more with overseas museums, and, in addition to allowing us to constantly change the items we have on display, we have found that this encourages museums, and even governments, to engage in dialogue.

Which museum director

has a different opinion from C on the value of using digital media to present exhibits?

37	
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shares B's view on the further benefit of museums exhibiting objects from other countries?

38	
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has a different opinion from A about the success of local museums?

39	
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has a different opinion from the others about how well museums cater for all levels of society?

40	
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Part 7

You are going to read a magazine article about ways of reusing escaped heat. Six paragraphs have been removed from the article. Choose from the paragraphs A–G the one which fits each gap (41–46). There is one extra paragraph which you do not need to use.

Mark your answers on the separate answer sheet.

City of Heat

Escaped heat costs us money and affects our climate. Chelsea Wald reports on a grand plan to capture it and put it to good use.

Deep in the tunnels of London's underground railway, as in many around the world, it's so hot it can feel very uncomfortable. And yet in the basement of a building only a few metres away from the station a boiler is firing to heat water for someone's shower.

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Recapturing it wouldn't just benefit our wallets. It would reverse some of the damaging effects on the climate. The good news is that several cities have found a way to hunt down their surplus heat in some unexpected places. These cities are building systems that deliver heat in much the same way that suppliers handle electricity and water. Could they point the way to the next energy revolution?

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It was also estimated that given the right technologies, we could reclaim nearly half of that energy, although that's easier said than done. 'We often talk about the quantity of waste heat,' says David MacKay, chief scientific adviser to the UK Department of Energy and Climate Change, 'but not the quality.' Most of what we think of as 'waste heat' isn't actually all that hot; about sixty percent is below 230°C. While that may sound pretty hot, it is too cold to turn a turbine to generate electricity.

43

There, buildings tap into the system to warm their water supplies or air for central heating. Many countries are encouraging such cogeneration, as it is called. A US initiative, for example, might save

the country \$10 billion per year. And cogeneration allows power plants to bump up their efficiencies from thirty percent to almost ninety percent.

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As it happens, there is an existing technology that can siphon energy from such temperatures, although applying it on a large scale to capture waste heat is as yet unachievable. Ground source heat pumps have been helping homeowners save on heating bills since the 1940s, when US inventor Robert Webber realised he could invert the refrigeration process to extract heat from the ground.

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The mechanism for this is simple. A network of pipes makes a circuit between the inside of the dwelling and a coil buried underground. These pipes contain a mix of water and fluid refrigerant. As the fluid mixture travels through the pipes buried underground, it absorbs the heat from the 10°C soil.

46

This system is powerful enough to efficiently provide heat even in places as cold as Norway and Alaska. It is also cheap. Scientists around the world are now working on the idea that the way ahead is to develop city-wide grids using source-heat pumps to recycle waste on a grander scale, from sources such as subways and sewers.

- A** But that's not all it can do. Reverse the process and it can cool a home in summer. If the ground is cold enough, it simply absorbs the heat from inside the building instead of from the ground.
- B** It's an attractive proposition. A report in 2008 found that the energy lost as heat each year by US industry equalled the annual energy use of five million citizens. Power generation is a major culprit; the heat lost from that sector alone dwarfs the total energy use of Japan. The situation in other industrialised countries is similar.
- C** Yet even this is just a drop in the ocean compared with the heat lost from our homes, offices, road vehicles and trains. However, waste heat from these myriad sources is much harder to harness than the waste heat from single, concentrated sources like power plants. What's more, it's barely warm enough to merit its name. Reclaiming that would be an altogether more difficult proposition.
- D** A more successful way of using the heat is to move the heat directly to where it is needed. A number of power plants now do exactly that. They capture some or all of their waste heat and send it – as steam or hot water – through a network of pipes to nearby cities.
- E** The system takes advantage of the fact that in temperate regions – regardless of surface temperature – a few metres underground, the soil always remains lukewarm and stable. These pumps can tap into that consistent temperature to heat a house in the winter.
- F** While this is not what you might consider hot, it nonetheless causes the liquid to evaporate into a gas. When this gas circulates back into the building, it is fed through a compressor, which vastly intensifies the heat. That heat can then be used by a heat exchanger to warm up hot water or air ducts.
- G** Rather than stewing in that excess heat, what if we could make it work for us? Throughout our energy system – from electricity generation in power plants to powering a car – more than fifty percent of the energy we use leaks into the surroundings.

