Use of English

Complete the text below by writing a suitable word in the space provided. The first one is done for you as an example. Indicate your answers on the Answer Sheet.

The Colonisation of Mars

Professor Cockell, the director of the UK Centre for Astrobiology, explains what life will be like **for (0)** the Red Planet's first inhabitants.

The new settlers' first priority will be putting in place the basic essentials for survival **… (1) …** ensuring that backup systems are fully functioning. They'll need to **… (2) …** sure that all oxygen production is working, and **… (3) …** they're topping up the oxygen from water gathered from the atmosphere, they will need to check **… (4) …** the extractor fans collecting atmospheric water are up **… (5) …** running. In the first weeks the colonists will be eating dried rations in boxes, **… (6) …**, they may have to spend their first weeks setting up a simple greenhouse **… (7) …** that they can begin to grow food as soon as possible.

A crucial matter for survival is energy. **… (8) …** they are using nuclear or solar energy, they will need to set up the apparatus **… (9) …** be linked to the base and ensure that the power supply is stable and reliable. **… (10) …,** a chemical apparatus must be set up to produce useful things **… (11) …** fuel. A layer of Martian rocks or water in the walls of the settlers' habitat could act **… (12) …** radiation shelter from the Sun's particle streams.

… (13) … of the above procedures will have been tested **… (14) …** the settlers land, so in principle it should be **… (15) …** a matter of plugging in the different kinds of equipment. But they will still need to check and cross-check all of the systems in a potentially lethal environment.

Max.: 15

Reading

Part 1

Read the article below from which 10 sentences have been removed. Match the list of sentences (A-M) with the gaps (1–10) and decide where they fit. Indicate your answers on the Answer Sheet. Remember there are *three extra sentences you do not need to use*.

Going underground

At first glance, geothermal energy seems almost too good to be true. It's clean, inexhaustible, and unlike other forms of renewable sources of energy which are intermittent, provides predictable 24-hour power and you can get it just about anywhere. These benefits, in combination with growing electricity use worldwide, concerns about limited supplies of fossil fuels, and efforts to reduce CO_2 emissions and prevent climate change, have prompted governments and investors to pour money into this emerging technology.

There's a snag, however. Outside of geologically blessed places, where volcanically active rocks are close to the surface, the Earth's heat is locked away under several kilometers of rock. **… (1) …** And the world is beginning to realize the potential of geothermal energy.

The key to tapping this resource is a relatively recent technology called enhanced geothermal systems (EGS), which can create a geothermal hotspot pretty much anywhere. The process involves fracturing hot rocks, then injecting cold water, which heats up as it circulates through the cracks and pathways of the reservoir. It is then pumped back to surface and passed through a heat exchanger, a secondary working fluid with a lower boiling point. **… (2) …** However, the cost of finding and tapping geothermal energy remain high.

Drilling, in particular, is costly. **… (3) …** But a lack of survey data means that these places are hard to find. What they are mostly doing now is blind drilling where hot water is coming out of the ground.

In fact, rocks at the necessary temperatures of between 150 and 250ºC are often 3 kilometers down or more. **… (4) …** So, California-based Potter Drilling is developing a hydrothermal drill to try to change that equation.

The team has designed a system that replaces conventional drill bits with a high-pressure jet of steam at 800ºC. **… (5) …** That means longer uninterrupted drilling times. Moreover, fewer delays and significant savings can be achieved. **… (6) …** If these savings can be realized, EGS would become viable basically everywhere.

Not everyone is convinced, however. The wells are more expensive than oil and gas wells because the product operators are getting out isn't very valuable until they get a lot of it, and all at once. **… (7) …**

Reading

There are other ideas to make EGS projects more efficient. One is to replace the water sent through an EGS reservoir with “supercritical” CO_2 – CO_2 at a temperature and pressure high enough to give it the properties of both gas and liquid. CO_2 becomes sequestered in the rock in the process. **… (8) …**

As well as financial considerations, there are practical obstacles to overcome before EGS is ready to go mainstream. For a start, injecting fluid into hot, dry rocks occasionally triggers earthquakes, which needs further investigations.

… (9) … Over half of the country's energy comes from geothermal sources. They are currently drilling into a reservoir of water which has been heated to 450ºC by a magma chamber below and is in a supercritical state. They say it's tricky stuff to handle as they can cause dangerous and expensive blow-outs, but they think, the risk may well be worth it, though. If they can tame the fluid, the wells could each produce an order of magnitude more power than a conventional geothermal borehole. **… (10) …** These “geopressured” reservoirs could yield not only heat from the fluid itself, but also chemical energy from the dissolved natural gas, and hydraulic energy from the extreme pressure.

A. Clearly, it is more cost-effective to drill where hot rocks are shallowest.

B. The development would increase heat outputs because supercritical CO_2 can move faster and more easily through the system than water.

C. Like other forms of renewable energy, geothermal power produces little or no CO_2.

D. There is no solid cutting edge, so there is very little wear on the equipment.

E. Now, though, new developments are making these depths easier and more cost-effective to reach.

F. The prices of the steel and cement used in well casings are soaring.

G. The steady, predictable baseload electricity geothermal power can provide all day and night makes it particularly appealing to utilities.

H. In Iceland, by contrast, the viability of geothermal energy isn't a problem.

I. The vapour from the fluid drives a turbine, generating electricity.

J. The deeper we go, the more expensive it gets.

K. There's still a way to go, but EGS could be the 'killer app' of the energy world.

L. Similarly explosive geothermal conditions can be found in underground reservoirs where gas-saturated liquids are trapped in deep sedimentary formations.

M. Reaching the same depth using the new drill could be up to an order of magnitude cheaper.

Max.: 20

Reading

Part 2

Read the text below and answer the questions in English. Give short answers. Indicate your answers on the Answer Sheet.

Get Deep in the Game

After years of hype, the moment of truth will arrive this week, when a virtual reality headset of a small company called Oculus, the Oculus Rift, launches – along with a few dozen games that aim to kick-start the VR gaming revolution.

Few technologies have been so hotly anticipated. But what will people make of them? The success of VR rests on the types of experiences it will offer. Many are versions of existing games that have been adapted to VR. But it is the games developed specifically for VR that could change the way we play. Games in VR give you a whole new mental and physical attachment to the fictional world. As well as the headset, VR games often make use of controllers that track your movements. These let you treat a controller as a gun – pointing it to aim as you would a real one – or a rope that you have to grip to climb a rock face, or a basketball you have to slam dunk. Motion controllers themselves are not new, but their greater sensitivity combined with the full immersion of a headset that covers your eyes and ears leads to extremely vivid experiences.

It sounds obvious, but what virtual reality lets us do is make the virtual a reality. You are present more than with any other medium. It has your full attention.

But a big challenge facing the VR industry is describing what that is like to those who have not tried it. It is almost impossible to convey the experience through any medium other than VR. “We have to get you in the virtual world with the headset on your face before you believe us that it's amazing,” say developers.

Game makers have had to overcome more practical issues too. One is how to give players a sense of freedom and movement when playing in their living room. Tripping over furniture and bumping into walls is one reality while you are saving the world in another can quickly break the spell. A wireframe showing where the edges of a room are can be superimposed over the virtual world to stop you hurting yourself. But most games also give you reasons not to move around too much.

In other games, players stand in one spot and move around in the game by teleporting. This also partly addresses the problem of motion sickness that many people experienced with VR software. Games have several other tricks to deal with this too, by creating less conflict between what you see in the virtual world and what you feel in the real one.

Reading

Even standing still, there is a lot of opportunity for visceral action. In a horror game in which you must survive an onslaught from hordes of monsters, the experience is so realistic that players reflexively step backwards when confronted, turn away and shield their face when hit, or lash out with their hands in defence. A handful of players have stopped playing because it is too frightening.

Although nascent, the potential of consumer VR is clear. The best experiences do not simply try to adapt the conventions of screen-based media. By separating us from the physical constraints of one reality, VR experiences could ultimately give us fresh ways of conceptualising things. We are about to leap into virtual reality worlds for the purpose of both education and entertainment, and gaming is about to become an even more of a mainstream hobby than it already is.

1. In what way are games adapted to VR different from their current versions?

2. In what respect is VR a “paradigm shift” in the games industry?

3. How has the use of motion controllers changed in games developed to kick-start the VR revolution?

4. In addition to the new type of motion controllers what helps create a more realistic virtual environment?

5. What makes the players think that the virtual is a reality?

6. What difficulty does the VR industry have to overcome in terms of promotion?

7. How do game makers try to prevent players from moving too much and hurting themselves? (a, b)

8. What do people often feel due to the conflict between the real world and the virtual one they are in?

9. Give two examples to prove that the experiences offered by the games developed for VR are extremely realistic. (a, b)

10. What potentiality do VR enthusiasts and developers see in this entirely new game medium?

Max.: 20

Writing

Part 1

You are working for Vodatel Ltd. as a junior assistant to the Purchasing Manager. You got the following e-mail from him. Read it carefully and write a letter of inquiry following his instructions in about 100-150 words. Use the conventions of a formal business letter.

Hi, Peter, you know that I will be out of town this coming week, but we have to sort out the problem of our call center by all means. I'd like to ask you to write a letter of inquiry in my name to EuroCall Ltd.

Remember to include the following points in your letter:

- what business we are in (our clients, range of our activities)
- we have problems with our present call center operator (don't go into details!) that's why we are looking for a new supplier
- tell them what we our expectations are
- ask for references and a detailed quotation

I'll be back next Wednesday, so you could also arrange a meeting with their sales rep either on Thursday or Friday morning.
Thanks a lot.
If in any doubt, my cell is on; just give me a ring if need arises.

George

Max.: 15

Writing

Part 2

Your views, written in the form of a 300-350-word opinion essay, will inform a report being prepared in the run-up to the 2016 UN climate summit.
Discuss the following topic:

The vision: a low carbon EU by 2050
The question: How?

- local and national energy policy -- renewable energy resources
- environment conscious urban planning (green roofs and facades, low-carbon buildings, etc.)
- green vehicles
- recycling

Max.: 25