READING

READING PASSAGE 1

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

Georgia O'Keeffe

For seven decades, Georgia O'Keeffe (1887–1986) was a major figure in American art. Remarkably, she remained independent from shifting art trends and her work stayed true to her own vision, which was based on finding the essential, abstract forms in nature. With exceptionally keen powers of observation and great finesse with a paintbrush, she recorded subtle nuances of colour, shape, and light that enlivened her paintings and attracted a wide audience.

Born in 1887 near Sun Prairie, Wisconsin to cattle breeders Francis and Ida O'Keeffe, Georgia was raised on their farm along with her six siblings. By the time she graduated from high school in 1905, she had determined to make her way as an artist. She studied the techniques of traditional painting at the Art Institute of Chicago school (1905) and the Art Students League of New York (1907–8). After attending university and then training college, she became an art teacher and taught in elementary schools, high schools, and colleges in Virginia, Texas, and South Carolina from 1911 to 1918.

During this period, O'Keeffe began to experiment with creating abstract compositions in charcoal, and produced a series of innovative drawings that led her art in a new direction. She sent some of these drawings to a friend in New York, who showed them to art collector and photographer Alfred Stieglitz in January 1916. Stieglitz was impressed, and exhibited the drawings later that year at his gallery on Fifth Avenue, New York City, where the works of many avant-garde artists and photographers were introduced to the American public.

With Stieglitz's encouragement and promise of financial support, O'Keeffe arrived in New York in June 1918 to begin a career as an artist. For the next three decades, Stieglitz vigorously promoted her work in twenty-two solo exhibitions and numerous group installations. The two were married in 1924. The ups and downs of their personal and professional relationship were recorded in Stieglitz's celebrated black-and-white portraits of O'Keeffe, taken over the course of twenty years (1917–37).

By the mid-1920s, O'Keeffe was recognized as one of America's most important and successful artists, widely known for the architectural pictures that dramatically depict the soaring skyscrapers of New York. But most often, she painted botanical subjects, inspired by annual trips to the Stieglitz family summer home. In her magnified images depicting flowers, begun in 1924, O'Keeffe brings the viewer right into the picture.

Enlarging the tiniest details to fill an entire metre-wide canvas emphasized their shapes and lines and made them appear abstract. Such daring compositions helped establish O'Keeffe's reputation as an innovative modernist.

In 1929, O'Keeffe made her first extended trip to the state of New Mexico. It was a visit that had a lasting impact on her life, and an immediate effect on her work. Over the next two decades she made almost annual trips to New Mexico, staying up to six months there, painting in relative solitude, then returning to New York each winter to exhibit the new work at Stieglitz's gallery. This pattern continued until she moved permanently to New Mexico in 1949.

There, O'Keeffe found new inspiration: at first, it was the numerous sun-bleached bones she came across in the state's rugged terrain that sparked her imagination. Two of her earliest and most celebrated Southwestern paintings exquisitely reproduce a cow skull's weathered surfaces, jagged edges, and irregular openings. Later, she also explored another variation on this theme in her large series of *Pelvis* pictures, which focused on the contrasts between convex and concave surfaces, and solid and open spaces.

However, it was the region's spectacular landscape, with its unusual geological formations, vivid colours, clarity of light, and exotic vegetation, that held the artist's imagination for more than four decades. Often, she painted the rocks, cliffs, and mountains in striking close-up, just as she had done with her botanical subjects.

O'Keeffe eventually owned two homes in New Mexico – the first, her summer retreat at Ghost Ranch, was nestled beneath 200-metre cliffs, while the second, used as her winter residence, was in the small town of Abiquiú. While both locales provided a wealth of imagery for her paintings, one feature of the Abiquiú house – the large walled patio with its black door – was particularly inspirational. In more than thirty pictures between 1946 and 1960, she reinvented the patio into an abstract arrangement of geometric shapes.

From the 1950s into the 1970s, O'Keeffe travelled widely, making trips to Asia, the Middle East, and Europe. Flying in planes inspired her last two major series – aerial views of rivers and expansive paintings of the sky viewed from just above clouds. In both series, O'Keeffe increased the size of her canvases, sometimes to mural proportions, reflecting perhaps her newly expanded view of the world. When in 1965 she successfully translated one of her cloud motifs to a monumental canvas measuring 6 metres in length (with the help of assistants), it was an enormous challenge and a special feat for an artist nearing eighty years of age.

The last two decades of the artist's life were relatively unproductive as ill health and blindness hindered her ability to work. O'Keeffe died in 1986 at the age of ninety-eight, but her rich legacy of some 900 paintings has continued to attract subsequent generations of artists and art lovers who derive inspiration from these very American images.

Questions 1–7

Complete the notes below.

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

Write your answers in boxes 1–7 on your answer sheet.

The life and work of Georgia O'Keeffe

- studied art, then worked as a **1** ..... in various places in the USA
- created drawings using **2** ..... which were exhibited in New York City
- moved to New York and became famous for her paintings of the city's **3** .....
- produced a series of innovative close-up paintings of **4** .....
- went to New Mexico and was initially inspired to paint the many **5** ..... that could be found there
- continued to paint various features that together formed the dramatic **6** ..... of New Mexico for over forty years
- travelled widely by plane in later years, and painted pictures of clouds and **7** ..... seen from above

Questions 8–13

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

In boxes 8–13 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*

8 Georgia O'Keeffe's style was greatly influenced by the changing fashions in art over the seven decades of her career.

9 When O'Keeffe finished high school, she had already made her mind up about the career that she wanted.

10 Alfred Stieglitz first discovered O'Keeffe's work when she sent some abstract drawings to his gallery in New York City.

11 O'Keeffe was the subject of Stieglitz's photographic work for many years.

12 O'Keeffe's paintings of the patio of her house in Abiquiú were among the artist's favourite works.

13 O'Keeffe produced a greater quantity of work during the 1950s to 1970s than at any other time in her life.

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READING PASSAGE 2

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

Deep-sea mining

Bacteria from the ocean floor can beat superbugs and cancer. But habitats are at risk from the hunger for marine minerals

A When Professor Mat Upton found that a microbe from a deep-sea sponge was killing pathogenic bugs in his laboratory, he realised it could be a breakthrough in the fight against antibiotic-resistant superbugs, which are responsible for thousands of deaths a year in the UK alone. Further tests confirmed that an antibiotic from the sponge bacteria, found living more than 700 metres under the sea at the Rockall trough in the north-east Atlantic, was previously unknown to science, boosting its potential as a life-saving medicine. But Upton, and other scientists who view the deep ocean and its wealth of unique and undocumented species as a prospecting ground for new medicines, fear such potential will be lost in the rush to exploit the deep sea's equally rich metal and mineral resources.

B 'We're looking at the bioactive potential of marine resources, to see if there are any more medicines or drugs down there before we destroy it for ever,' says Upton, a medical microbiologist at the University of Plymouth. He is among many scientists urging a halt to deep-sea mining, asking for time to weigh up the pros and cons. 'In sustainability terms, this could be a better way of exploiting the economic potential of the deep sea,' he argues. Oceanographers using remotely operated vehicles have spotted many new species. Among them have been sea cucumbers with tails allowing them to sail along the ocean floor, and a rare 'Dumbo' octopus, found 3,000 metres under the Pacific Ocean, off the coast of California. Any one of these could offer lifesaving potential. Upton estimates it could take up to a decade for a newly discovered antibiotic to become a medicine – but the race towards commercial mining in the ocean abyss has already begun.

C The deep sea contains more nickel, cobalt and rare earth metals than all land reserves combined, according to the US Geological Survey. Mining corporations argue that deep-sea exploration could help diversify the supply of metals and point to the fact that demand for resources such as copper, aluminium, cobalt for electric car batteries and other metals to power technology and smartphones, is soaring. They say that deep-sea mining could yield far superior ore to land mining with little, if any, waste. Different methods of extraction exist, but most involve employing some form of converted machinery previously used in terrestrial mining to excavate materials from the sea floor, at depths of up to 6,000 metres, then drawing a seawater slurry, containing rock and other solid particles, from the sea floor to ships on the surface. The slurry is then 'de-watered' and transferred to another vessel for shipping. Extracted seawater is pumped back down and discharged close to the sea floor.

D But environmental and legal groups have urged caution, arguing there are potentially massive and unknown ramifications for the environment and for nearby communities, and that the global regulatory framework is not yet drafted. 'Despite arising in the last half century, the "new global gold rush" of deep-sea mining shares many features with past resource scrambles – including a general disregard for environmental and social impacts, and the marginalisation of indigenous peoples and their rights,' a paper, written by Julie Hunter and Julian Aguon, from Blue Ocean Law, and Pradeep Singh, from the Center for Marine Environmental Sciences, Bremen, argues. The authors say that knowledge of the deep seabed remains extremely limited. 'The surface of the Moon, Mars and even Venus have all been mapped and studied in much greater detail, leading marine scientists to commonly remark that, with respect to the deep sea, "We don't yet know what we need to know".'

E Scientific research – including a recent paper in Marine Policy journal – has suggested the deep seabed, and hydrothermal vents, which are created when seawater meets volcanic magma, have crucial impacts upon biodiversity and the global climate. The mineral-rich vents and their surrounds are also home to many well-known animals including crustaceans, tubeworms, clams, slugs, anemones and fish. 'It is becoming increasingly clear that deep-sea mining poses a grave threat to these vital seabed functions,' the paper says. 'Extraction methods would produce large sediment plumes and involve the discharge of waste back into the ocean, significantly disturbing seafloor environments,' the paper continues. 'On deep sea vents, scientists are clear,' says Dr Jon Copley of the National Oceanography Centre, Southampton: 'we don't want mining on them.'

F The oceans occupy around 70% of the planet and are relatively unexplored, says Mike Johnston, chief executive of Nautilus, a Canadian underwater exploration company: 'It makes sense to explore this untapped potential in an environmentally sustainable way, instead of continually looking at the fast depleting land resources of the planet to meet society's rising needs.' Those leading the global rush to place giant mining machines thousands of metres below the sea surface say the environmental impacts will be far lower than on land. But critics say exotic and little-known ecosystems in the deep oceans could be destroyed and must be protected. 'Mining will be the greatest assault on deep-sea ecosystems ever inflicted by humans,' according to hydrothermal vent expert Verena Tunnicliffe, at the University of Victoria in Canada. She argues that active vents must be off-limits for mining to protect the new knowledge and biotechnology spin-offs they can deliver, and that strict controls must be in place elsewhere.

Questions 14–17

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

Which paragraph contains the following information?

*Write the correct letter, **A–F**, in boxes 14–17 on your answer sheet.*

14 reference to the rapidly increasing need for one raw material in the transport industry

15 a rough estimate of the area of the Earth covered by the oceans

16 how a particular underwater habitat, where minerals and organisms co-exist, is formed

17 reference to the fact that the countries of the world have yet to agree on rules for the exploration of the seabed

Questions 18–23

Look at the following statements (Questions 18–23) and the list of people below.

*Match each statement with the correct person or people, **A–E**.*

*Write the correct letter, **A–E**, in boxes 18–23 on your answer sheet.*

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

18 A move away from the exploration of heavily mined reserves on land is a good idea.

19 The negative effects of undersea exploration on local areas and their inhabitants are being ignored.

20 There are more worthwhile things to extract from the sea than minerals.

21 No other form of human exploration will have such a destructive impact on marine life as deep-sea mining.

22 More is known about outer space than about what lies beneath the oceans.

23 There is one marine life habitat where experts agree mining should not take place.

List of People

A Professor Mat Upton

B Julie Hunter, Julian Aguon and Pradeep Singh

C Dr Jon Copley

D Mike Johnston

E Verena Tunnicliffe

Questions 24–26

Complete the summary below.

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

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

Mining the sea floor

Mining corporations believe that the mineral resources lying under the sea may be superior to those found in the earth. They also say that these can be removed without producing much **24** ..... .

The extraction is often done by adapting the **25** ..... that has already been used to work on land. The method of excavation involves removing the seawater from the slurry that is brought up to ships and returning it to the seabed. However, concerned groups strongly believe that **26** ..... is necessary due to the possible number of unidentified consequences.

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READING PASSAGE 3

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

The Unselfish Gene

A psychologist gives his view on how humans became self-centred

There has long been a general assumption that human beings are essentially selfish. We're apparently ruthless, with strong impulses to compete against each other for resources and to accumulate power and possessions. If we are kind to one another, it's usually because we have ulterior motives. If we are good, it's only because we have managed to control and transcend our innate selfishness and brutality.

This bleak view of human nature is closely associated with the science writer Richard Dawkins, whose 1976 book *The Selfish Gene* became popular because it fitted so well with – and helped to justify – the competitive and individualistic ethos that was so prevalent in late 20th-century societies. Like many others, Dawkins justifies his views with reference to the field of evolutionary psychology. Evolutionary psychology theorises that present-day human traits developed in prehistoric times, during what is termed the 'environment of evolutionary adaptedness'.

Prehistory is usually seen as a period of intense competition, when life was such a brutal battle that only those with traits such as selfishness, aggression and ruthlessness survived. And because survival depended on access to resources – such as rivers, forests and animals – there was bound to be conflict between rival groups, which led to the development of traits such as racism and warfare. This seems logical. But, in fact, the assumption on which this all rests – that prehistoric life was a desperate struggle for survival – is false.

It's important to remember that in the prehistoric era, the world was very sparsely populated. According to some estimates, around 15,000 years ago, the population of Europe was only 29,000, and the population of the whole world was less than half a million. Humans at that time were hunter-gatherers: people who lived by hunting wild animals and collecting wild plants. With such small population densities, it seems unlikely that prehistoric hunter-gatherer groups had to compete against each other for resources or had any need to develop ruthlessness and competitiveness, or to go to war.

There is significant evidence to back this notion from contemporary hunter-gatherer groups, who live in the same way as prehistoric humans did. As the anthropologist Bruce Knauft has remarked, hunter-gatherers are characterised by 'extreme political and sexual egalitarianism'. Knauft has observed that individuals in such groups don't accumulate property or possessions and have an ethical obligation to share everything. They also have methods of preserving egalitarianism by ensuring that disparities of status don't arise.

The *!Kung* people of southern Africa, for example, swap arrows before going hunting and when an animal is killed, the acclaim does not go to the person who fired the arrow, but to the person the arrow belongs to. And if a person becomes too domineering, the other members of the group ostracise them, exiling the offender from society. Typically in such groups, men do not dictate what women do. Women in hunter-gatherer groups worldwide often benefit from a high level of autonomy, being able to select their own marriage partners, decide what work they do and work whenever they choose to. And if a marriage breaks down, they have custody rights over their children.

Many anthropologists believe that societies such as the *!Kung* were normal until a few thousand years ago, when population growth led to the development of agriculture and a settled lifestyle. In view of the above, there seems little reason to assume that traits such as racism, warfare and male domination should have been selected by evolution – as they would have been of little benefit in the prehistoric era. Individuals who behaved selfishly and ruthlessly would be less likely to survive, since they would have been ostracised from their groups.

It makes more sense, then, to see traits such as cooperation, egalitarianism, altruism and peacefulness as innate characteristics of human beings. These were the traits that were prevalent in human life for tens of thousands of years. So presumably these traits are still strong in us now.

But if prehistoric life wasn't really as brutal as has often been assumed, why do modern humans behave so selfishly and ruthlessly? Perhaps these negative traits should be seen as a later development, the result of environmental and psychological factors. Research has shown repeatedly that when the natural habitats of primates such as apes and gorillas are disrupted, they tend to become more violent and hierarchical.

So, it could well be that the same thing has happened to us. I believe that the end of the hunter-gatherer lifestyle and the advent of farming was connected to a psychological change that occurred in some groups of people. There was a new sense of individuality and separateness, which led to a new selfishness, and ultimately to hierarchical societies, patriarchy and warfare. At any rate, these negative traits appear to have developed so recently that it doesn't seem feasible to explain them in adaptive or evolutionary terms.

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 is the writer doing in the first paragraph?

A setting out two opposing views about human nature
B justifying his opinion about our tendency to be greedy
C describing a commonly held belief about people's behaviour
D explaining why he thinks that humans act in a selfish manner

28 What point is made about Richard Dawkins' book *The Selfish Gene*?

A Its appeal lay in the radical nature of its ideas.
B Its success was due to the scientific support it offered.
C It presented a view that was in line with the attitudes of its time.
D It took an innovative approach to the analysis of human psychology.

29 What does the writer suggest about the prehistoric era in the fourth paragraph?

A Societies were more complex than many people believe.
B Supplies of natural resources were probably relatively plentiful.
C Most estimates about population sizes are likely to be inaccurate.
D Humans moved across continents more than was previously thought.

30 The writer refers to Bruce Knauft's work as support for the idea that

A selfishness is a relatively recent development in human societies.
B only people in isolated communities can live in an unselfish manner.
C very few lifestyles have survived unchanged since prehistoric times.
D hunter-gatherer cultures worldwide are declining in number.

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.

Contemporary hunter-gatherer societies

Bruce Knauft's research shows that contemporary hunter-gatherer societies tend to exhibit a high level of **31** ..... in all areas of life. In these cultures, distributing resources fairly among all members is a moral obligation. These societies also employ strategies to prevent differences in **32** ..... occurring: for example, the *!Kung* follow a custom whereby the credit for one person's success at **33** ..... is given to another member of the group. Individuals who behave in a **34** ..... manner are punished by being excluded from the group, and women have a considerable amount of **35** ..... in choices regarding work and marriage.

Questions 36–40

Do the following statements agree with the views of the writer in Reading Passage 3?

In boxes 36–40 on your answer sheet, write

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

36 Some anthropologists are mistaken about the point when the number of societies such as the *!Kung* began to decline.

37 Humans who developed warlike traits in prehistory would have had an advantage over those who did not.

38 Being peaceful and cooperative is a natural way for people to behave.

39 Negative traits are more apparent in some modern cultures than in others.

40 Animal research has failed to reveal a link between changes in the environment and the emergence of aggressive tendencies.

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