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TỔNG HỢP 20 BÀI MẪU DẠNG MATCHING INFORMATION IELTS READING (KÈM ĐÁP ÁN)

BÀI 1: CAMBRIDGE IELTS 12 - TEST 6 - READING PASSAGE 1

The risks agriculture faces in developing countries

Synthesis of an online debate

A Two things distinguish food production from all other productive activities: first, every single person needs food each day and has a right to it; and second, it is hugely dependent on nature. These two unique aspects, one political, the other natural, make food production highly vulnerable and different from any other business. At the same time, cultural values are highly entrenched in food and agricultural systems worldwide.

B Farmers everywhere face major risks, including extreme weather, long-term climate change, and price volatility in input and product markets. However, smallholder farmers in developing countries must in addition deal with adverse environments, both natural, in terms of soil quality, rainfall, etc., and human, in terms of infrastructure, financial systems, markets, knowledge and technology. Counter-intuitively, hunger is prevalent among many smallholder farmers in the developing world.

C Participants in the online debate argued that our biggest challenge is to address the underlying causes of the agricultural system's inability to ensure sufficient food for all, and they identified as drivers of this problem our dependency on fossil fuels and unsupportive government policies.

D On the question of mitigating the risks farmers face, most essayists called for greater state intervention. In his essay, Kanayo F. Nwanze, President of the International Fund for Agricultural Development, argued that governments can significantly reduce risks for farmers by providing basic services like roads to get produce more efficiently to markets, or water and food storage facilities to reduce losses. Sophia Murphy, senior advisor to the Institute for Agriculture and Trade Policy, suggested that the procurement and holding of stocks by governments can also help mitigate wild swings in food prices by alleviating uncertainties about market supply.

E Shenggen Fan, Director General of the International Food Policy Research Institute, held up social safety nets and public welfare programmes in Ethiopia, Brazil and Mexico as valuable ways to address poverty among farming families and reduce their vulnerability to agriculture shocks. However, some commentators responded that cash transfers to poor families do not necessarily translate into increased food security, as these programmes do not always strengthen food production or raise incomes. Regarding state subsidies for agriculture, Rokeya Kabir, Executive Director of Bangladesh Nari Progati Sangha, commented in her essay that these 'have not compensated for the stranglehold exercised by private traders. In fact, studies show that sixty percent of beneficiaries of subsidies are not poor, but rich landowners and non-farmer traders.'

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F Nwanze, Murphy and Fan argued that private risk management tools, like private insurance, commodity futures markets, and rural finance can help small-scale producers mitigate risk and allow for investment in improvements. Kabir warned that financial support schemes often encourage the adoption of high-input agricultural practices, which in the medium term may raise production costs beyond the value of their harvests. Murphy noted that when futures markets become excessively financialised they can contribute to short-term price volatility, which increases farmers' food insecurity. Many participants and commentators emphasised that greater transparency in markets is needed to mitigate the impact of volatility, and make evident whether adequate stocks and supplies are available. Others contended that agribusiness companies should be held responsible for paying for negative side effects.

G Many essayists mentioned climate change and its consequences for small-scale agriculture. Fan explained that 'in addition to reducing crop yields, climate change increases the magnitude and the frequency of extreme weather events, which increase smallholder vulnerability.' The growing unpredictability of weather patterns increases farmers' difficulty in managing weather-related risks. According to this author, one solution would be to develop crop varieties that are more resilient to new climate trends and extreme weather patterns. Accordingly, Pat Mooney, co-founder and executive director of the ETC Group, suggested that 'if we are to survive climate change, we must adopt policies that help peasants diversify the plant and animal species and varieties/breeds that make up our menus.'

H Some participating authors and commentators argued in favour of community-based and autonomous risk management strategies through collective action groups, co-operatives or producers' groups. Such groups enhance market opportunities for small-scale producers, reduce marketing costs and synchronise buying and selling with seasonal price conditions. According to Murphy, 'collective action offers an important way for farmers to strengthen their political and economic bargaining power, and to reduce their business risks.' One commentator, Giel Ton, warned that collective action does not come as a free good. It takes time, effort and money to organise, build trust and to experiment. Others, like Marcel Vernooij and Marcel Beukeboom, suggested that in order to 'apply what we already know', all stakeholders, including business, government, scientists and civil society, must work together, starting at the beginning of the value chain.

I Some participants explained that market price volatility is often worsened by the presence of intermediary purchasers who, taking advantage of farmers' vulnerability, dictate prices. One commentator suggested farmers can gain greater control over prices and minimise price volatility by selling directly to consumers. Similarly, Sonali Bisht, founder and advisor to the Institute of Himalayan Environmental Research and Education (INHERE), India, wrote that community-supported agriculture, where consumers invest in local farmers by subscription and guarantee producers a fair price, is a risk-sharing model worth more attention. Direct food distribution systems not only encourage small-scale agriculture but also give consumers more control over the food they consume, she wrote.

Questions 1-3:

Reading Passage 1 has nine paragraphs, **A-I**.

Which paragraph contains the following information?

*Write the correct letter, **A-I**, in boxes 1-3 on your answer sheet.*

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1. a reference to characteristics that only apply to food production

2. a reference to challenges faced only by farmers in certain parts of the world

3. a reference to difficulties in bringing about co-operation between farmers

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BÀI 2: CAMBRIDGE IELTS 12 - TEST 6 - READING PASSAGE 3

The Benefits of Being Bilingual

A According to the latest figures, the majority of the world's population is now bilingual or multilingual, having grown up speaking two or more languages. In the past, such children were considered to be at a disadvantage compared with their monolingual peers. Over the past few decades, however, technological advances have allowed researchers to look more deeply at how bilingualism interacts with and changes the cognitive and neurological systems, thereby identifying several clear benefits of being bilingual.

B Research shows that when a bilingual person uses one language, the other is active at the same time. When we hear a word, we don't hear the entire word all at once: the sounds arrive in sequential order. Long before the word is finished, the brain's language system begins to guess what that word might be. If you hear 'can', you will likely activate words like 'candy' and 'candle' as well, at least during the earlier stages of word recognition. For bilingual people, this activation is not limited to a single language; auditory input activates corresponding words regardless of the language to which they belong. Some of the most compelling evidence for this phenomenon, called 'language co-activation', comes from studying eye movements. A Russian-English bilingual asked to 'pick up a marker' from a set of objects would look more at a stamp than someone who doesn't know Russian, because the Russian word for 'stamp', marka, sounds like the English word he or she heard, 'marker'. In cases like this, language co-activation occurs because what the listener hears could map onto words in either language.

C Having to deal with this persistent linguistic competition can result in difficulties, however. For instance, knowing more than one language can cause speakers to name pictures more slowly, and can increase 'tip-of-the-tongue states', when you can almost, but not quite, bring a word to mind. As a result, the constant juggling of two languages creates a need to control how much a person accesses a language at any given time. For this reason, bilingual people often perform better on tasks that require conflict management. In the classic Stroop Task, people see a word and are asked to name the colour of the word's font. When the colour and the word match (i.e., the word 'red' printed in red), people correctly name the colour more quickly than when the colour and the word don't match (i.e., the word 'red' printed in blue). This occurs because the word itself ('red') and its font colour (blue) conflict. Bilingual people often excel at tasks such as this, which tap into the ability to ignore competing perceptual information and focus on the relevant aspects of the input. Bilinguals are also better at switching between two tasks; for example, when bilinguals have to switch from categorizing objects by colour (red or green) to categorizing them by shape (circle or triangle), they do so more quickly than monolingual people, reflecting better cognitive control when having to make rapid changes of strategy.

D It also seems that the neurological roots of the bilingual advantage extend to brain

areas more traditionally associated with sensory processing. When monolingual and bilingual adolescents listen to simple speech sounds without any intervening background noise, they show highly similar brain stem responses. When researchers play the same sound to both groups in the presence of background noise, however, the bilingual listeners' neural response is considerably larger, reflecting better encoding of the sound's fundamental frequency, a feature of sound closely related to pitch perception.

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E Such improvements in cognitive and sensory processing may help a bilingual person to process information in the environment, and help explain why bilingual adults acquire a third language better than monolingual adults master a second language. This advantage may be rooted in the skill of focussing on information about the new language while reducing interference from the languages they already know.

F Research also indicates that bilingual experience may help to keep the cognitive mechanisms sharp by recruiting alternate brain networks to compensate for those that become damaged during aging. Older bilinguals enjoy improved memory relative to monolingual people, which can lead to real-world health benefits. In a study of over 200 patients with Alzheimer's disease, a degenerative brain disease, bilingual patients reported showing initial symptoms of the disease an average of five years later than monolingual patients. In a follow-up study, researchers compared the brains of bilingual and monolingual patients matched on the severity of Alzheimer's symptoms. Surprisingly, the bilinguals' brains had more physical signs of disease than their monolingual counterparts, even though their outward behaviour and abilities were the same. If the brain is an engine, bilingualism may help it to go farther on the same amount of fuel.

G Furthermore, the benefits associated with bilingual experience seem to start very early. In one study, researchers taught seven-month-old babies growing up in monolingual or bilingual homes that when they heard a tinkling sound, a puppet appeared on one side of a screen. Halfway through the study, the puppet began appearing on the opposite side of the screen. In order to get a reward, the infants had to adjust the rule they'd learned; only the bilingual babies were able to successfully learn the new rule. This suggests that for very young children, as well as for older people, navigating a multilingual environment imparts advantages that transfer far beyond language.

Questions 37-40:

Which paragraph contains the following information?

Write the correct letter, **A-G**, in boxes 37-40 on your answer sheet.

37. an example of how bilingual and monolingual people's brains respond differently to a certain type of non-verbal auditory input

38. a demonstration of how a bilingual upbringing has benefits even before we learn to speak

39. a description of the process by which people identify words that they hear

40. reference to some negative consequences of being bilingual

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BÀI 3: CAMBRIDGE IELTS 12 - TEST 7 - READING PASSAGE 2

The Intersection of Health Sciences and Geography

A While many diseases that affect humans have been eradicated due to improvements in vaccinations and the availability of healthcare, there are still areas around the world where certain health issues are more prevalent. In a world that is far more globalised than ever before, people come into contact with one another through travel and living closer and closer to each other. As a result, super-viruses and other infections resistant to antibiotics are becoming more and more common.

B Geography can often play a very large role in the health concerns of certain populations. For instance, depending on where you live, you will not have the same health concerns as someone who lives in a different geographical region. Perhaps one of the most obvious examples of this idea is malaria-prone areas, which are usually tropical regions that foster a warm and damp environment in which the mosquitos that can give people this disease can grow. Malaria is much less of a problem in high-altitude deserts, for instance.

C In some countries, geographical factors influence the health and well-being of the population in very obvious ways. In many large cities, the wind is not strong enough to clear the air of the massive amounts of smog and pollution that cause asthma, lung problems, eyesight issues and more in the people who live there. Part of the problem is, of course, the massive number of cars being driven, in addition to factories that run on coal power. The rapid industrialisation of some countries in recent years has also led to the cutting down of forests to allow for the expansion of big cities, which makes it even harder to fight the pollution with the fresh air that is produced by plants.

D It is in situations like these that the field of health geography comes into its own. It is an increasingly important area of study in a world where diseases like polio are re-emerging, respiratory diseases continue to spread, and malaria-prone areas are still fighting to find a better cure. Health geography is the combination of, on the one hand, knowledge regarding geography and methods used to analyse and interpret geographical information, and on the other, the study of health, diseases and healthcare practices around the world. The aim of this hybrid science is to create solutions for common geography-based health problems. While people will always be prone to illness, the study of how geography affects our health could lead to the eradication of certain illnesses, and the prevention of others in the future. By understanding why and how we get sick, we can change the way we treat illness and disease specific to certain geographical locations.

E The geography of disease and ill health analyses the frequency with which certain diseases appear in different parts of the world, and overlays the data with the geography of the region, to see if there could be a correlation between the two. Health geographers also study factors that could make certain individuals or a population more likely to be taken ill with a specific health concern or disease, as compared with the population of another area. Health geographers in this field are usually trained as healthcare workers, and have an understanding of basic epidemiology as it relates to the spread of diseases among the population,

F Researchers study the interactions between humans and their environment that could lead to illness (such as asthma in places with high levels of pollution) and work to create a clear way of categorising illnesses, diseases and epidemics into local and global scales. Health geographers can map the spread of illnesses and attempt to identify the reasons behind an increase or decrease in illnesses, as they work to find a way to halt the further spread or re-emergence of diseases in vulnerable populations.

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G The second subcategory of health geography is the geography of healthcare provision. This group studies the availability (or lack thereof) of healthcare resources to individuals and populations around the world. In both developed and developing nations there is often a very large discrepancy between the options available to people in different social classes, income brackets, and levels of education. Individuals working in the area of the geography of healthcare provision attempt to assess the levels of healthcare in the area (for instance, it may be very difficult for people to get medical attention because there is a mountain between their village and the nearest hospital). These researchers are on the frontline of making recommendations regarding policy to international organisations, local government bodies and others.

H The field of health geography is often overlooked, but it constitutes a huge area of need in the fields of geography and healthcare. If we can understand how geography affects our health no matter where in the world we are located, we can better treat disease, prevent illness, and keep people safe and well.

Questions 14-19:

Reading Passage 2 has eight sections, **A-H**.

Which paragraph contains the following information?

*Write the correct letter, **A-H**, in boxes 14-19 on your answer sheet.*

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

14. an acceptance that not all diseases can be totally eliminated

15. examples of physical conditions caused by human behaviour

16. a reference to classifying diseases on the basis of how far they extend geographically

17. reasons why the level of access to healthcare can vary within a country

18. a description of health geography as a mixture of different academic fields

19. a description of the type of area where a particular illness is rare

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BÀI 4: CAMBRIDGE IELTS 13 - TEST 2 - READING PASSAGE 2

Oxytocin

The positive and negative effects of the chemical known as the 'love hormone'

A Oxytocin is a chemical, a hormone produced in the pituitary gland in the brain. It was through various studies focusing on animals that scientists first became aware of the influence of oxytocin. They discovered that it helps reinforce the bonds between prairie voles, which mate for life, and triggers the motherly behaviour that sheep show towards their newborn lambs. It is also released by women in childbirth, strengthening the attachment between mother and baby. Few chemicals have as positive a reputation as oxytocin, which is sometimes referred to as the 'love hormone'. One sniff of it can, it is claimed, make a person more trusting, empathetic, generous and cooperative. It is time, however, to revise this wholly optimistic view. A new wave of studies has shown that its effects vary greatly depending on the person and the circumstances, and it can impact on our social interactions for worse as well as for better.

B Oxytocin's role in human behaviour first emerged in 2005. In a groundbreaking experiment, Markus Heinrichs and his colleagues at the University of Freiburg, Germany, asked volunteers to do an activity in which they could invest money with an anonymous person who was not guaranteed to be honest. The team found that participants who had sniffed oxytocin via a nasal spray beforehand invested more money than those who received a placebo instead. The study was the start of research into the effects of oxytocin on human interactions. 'For eight years, it was quite a lonesome field,' Heinrichs recalls. 'Now, everyone is interested.' These follow-up studies have shown that after a sniff of the hormone, people become more charitable, better at reading emotions on others' faces and at communicating

constructively in arguments. Together, the results fuelled the view that oxytocin universally enhanced the positive aspects of our social nature.

C Then, after a few years, contrasting findings began to emerge. Simone Shamay-Tsoory at the University of Haifa, Israel, found that when volunteers played a competitive game, those who inhaled the hormone showed more pleasure when they beat other players, and felt more envy when others won. What's more, administering oxytocin also has sharply contrasting outcomes depending on a person's disposition. Jennifer Bartz from Mount Sinai School of Medicine, New York, found that it improves people's ability to read emotions, but only if they are not very socially adept to begin with. Her research also shows that oxytocin in fact reduces cooperation in subjects who are particularly anxious or sensitive to rejection.

D Another discovery is that oxytocin's effects vary depending on who we are interacting with. Studies conducted by Carolyn DeClerck of the University of Antwerp, Belgium, revealed that people who had received a dose of oxytocin actually became less cooperative when dealing with complete strangers. Meanwhile, Carsten De Dreu at the University of Amsterdam in the Netherlands discovered that volunteers given oxytocin showed favouritism: Dutch men became quicker to associate positive words with Dutch names than with foreign ones, for example. According to De Dreu, oxytocin drives people to care for those in their social circles and defend them from outside dangers. So, it appears that oxytocin strengthens biases, rather than promoting general goodwill, as was previously thought.

E There were signs of these subtleties from the start. Bartz has recently shown that in almost half of the existing research results, oxytocin influenced only certain individuals or in certain

circumstances. Where once researchers took no notice of such findings, now a more nuanced understanding of oxytocin's effects is propelling investigations down new lines. To Bartz, the key to understanding what the hormone does lies in pinpointing its core function rather than in cataloguing its seemingly endless effects. There are several hypotheses which are not mutually exclusive. Oxytocin could help to reduce anxiety and fear. Or it could simply motivate people to seek out social connections. She believes that oxytocin acts as a chemical spotlight that shines on social clues - a shift in posture, a flicker of the eyes, a dip in the voice – making people more attuned to their social environment. This would explain why it makes us more likely to look others in the eye and improves our ability to identify emotions. But it could also make things worse for people who are overly sensitive or prone to interpreting social cues in the worst light.

F Perhaps we should not be surprised that the oxytocin story has become more perplexing. The hormone is found in everything from octopuses to sheep, and its evolutionary roots stretch back half a billion years. 'It's a very simple and ancient molecule that has been co-opted for many different functions,' says Sue Carter at the University of Illinois, Chicago, USA. 'It affects primitive parts of the brain like the amygdala, so it's going to have many effects on just about everything.' Bartz agrees. 'Oxytocin probably does some very basic things, but once you add our higher-order thinking and social situations, these basic processes could manifest in different ways depending on individual differences and context.'

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.*

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

14. reference to research showing the beneficial effects of oxytocin on people

15. reasons why the effects of oxytocin are complex

16. mention of a period in which oxytocin attracted little scientific attention

17. reference to people ignoring certain aspects of their research data

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BÀI 5: CAMBRIDGE IELTS 13 - TEST 3 - READING PASSAGE 2

How baby talk gives infant brains a boost

A The typical way of talking to a baby - high-pitched, exaggerated and repetitious - is a source of fascination for linguists who hope to understand how 'baby talk' impacts on learning. Most babies start developing their hearing while still in the womb, prompting some hopeful parents to play classical music to their pregnant bellies. Some research even suggests that infants are listening to adult speech as early as 10 weeks before being born, gathering the basic building blocks of their family's native tongue.

B Early language exposure seems to have benefits to the brain - for instance, studies suggest that babies raised in bilingual homes are better at learning how to mentally prioritize information. So how does the sweet if sometimes absurd sound of infant-directed speech influence a baby's development? Here are some recent studies that explore the science behind baby talk.

C Fathers don't use baby talk as often or in the same ways as mothers - and that's perfectly OK, according to a new study. Mark VanDam of Washington State University at Spokane and colleagues equipped parents with recording devices and speech-recognition software to study the way they interacted with their youngsters during a normal day. 'We found that moms do exactly what you'd expect and what's been described many times over,' VanDam explains. 'But we found that dads aren't doing the same thing. Dads didn't raise their pitch or fundamental frequency when they talked to kids.' Their role may be rooted in what is called the bridge hypothesis, which dates back to 1975. It suggests that fathers use less familial language to provide their children with a bridge to the kind of speech they'll hear in public. 'The idea is that a kid gets to practice a certain kind of speech with mom and another kind of speech with dad, so the kid then has a wider repertoire of kinds of speech to practice,' says VanDam.

D Scientists from the University of Washington and the University of Connecticut collected thousands of 30-second conversations between parents and their babies, fitting 26 children with audio-recording vests that captured language and sound during a typical eight-hour day. The study found that the more baby talk parents used, the more their youngsters began to babble. And when researchers saw the same babies at age two, they found that frequent baby talk had dramatically boosted vocabulary, regardless of socioeconomic status. 'Those children who listened to a lot of baby talk were talking more than the babies that listened to more adult talk or standard speech,' says Nairán Ramírez-Esparza of the University of Connecticut. 'We also found that it really matters whether you use baby talk in a one-on-one context,' she adds. 'The more parents use baby talk one-on-one, the more babies babble, and the more they babble, the more words they produce later in life.

E Another study suggests that parents might want to pair their youngsters up so they can babble more with their own kind. Researchers from McGill University and Université du Québec à Montréal found that babies seem to like listening to each other rather than to adults - which may be why baby talk is such a universal tool among parents. They played repeating vowel sounds made by a special synthesizing device that mimicked sounds made by either an adult woman or another baby. This way,only the impact of the auditory cues was observed. The team then measured how long each type of sound held the infants' attention. They found that the 'infant' sounds held babies' attention nearly 40 percent longer. The baby noises also induced more reactions in the listening infants, like smiling or lip moving, which approximates sound making. The team theorizes that this attraction to other infant sounds could help launch the learning process that leads to speech. 'It may be some property of the

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sound that is just drawing their attention,' says study co-author Linda Polka. 'Or maybe they are really interested in that particular type of sound because they are starting to focus on their own ability to make sounds. We are speculating here but it might catch their attention because they recognize it as a sound they could possibly make.'

F In a study published in Proceedings of the National Academy of Sciences, a total of 57 babies from two slightly different age groups - seven months and eleven and a half months - were played a number of syllables from both their native language (English) and a non-native tongue (Spanish). The infants were placed in a brain- activation scanner that recorded activity in a brain region known to guide the motor movements that produce speech. The results suggest that listening to baby talk prompts infant brains to start practicing their language skills. 'Finding activation in motor areas of the brain when infants are simply listening is significant, because it means the baby brain is engaged in trying to talk back right from the start, and suggests that seven-month-olds' brains are already trying to figure out how to make the right movements that will produce words,' says co-author Patricia Kuhl. Another interesting finding was that while the seven-month-olds responded to all speech sounds regardless of language, the brains of the older infants worked harder at the motor activations of non-native sounds compared to native sounds. The study may have also uncovered a process by which babies recognize differences between their native language and other tongues.

Questions 24-26:

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

Which paragraph contains the following information?

*Write the correct letter, **A-F**, in boxes 24-26 on your answer sheet.*

24. a reference to a change which occurs in babies' brain activity before the end of their first year

25. an example of what some parents do for their baby's benefit before birth

26. a mention of babies' preference for the sounds that other babies make

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BÀI 6: CAMBRIDGE IELTS 13 - TEST 3 - READING PASSAGE 3

Whatever happened to the Harappan Civilisation?

New research sheds light on the disappearance of an ancient society

A The Harappan Civilisation of ancient Pakistan and India flourished 5,000 years ago, but a thousand years later their cities were abandoned. The Harappan Civilisation was a sophisticated Bronze Age society who built 'megacities' and traded internationally in luxury craft products, and yet seemed to have left almost no depictions of themselves. But their lack of self-imagery - at a time when the Egyptians were carving and painting representations of themselves all over their temples - is only part of the mystery.

B 'There is plenty of archaeological evidence to tell us about the rise of the Harappan Civilisation, but relatively little about its fall,' explains archaeologist Dr Cameron Petrie of the University of Cambridge. 'As populations increased, cities were built that had great baths, craft workshops, palaces and halls laid out in distinct sectors. Houses were arranged in blocks, with wide main streets and narrow alleyways, and many had their own wells and drainage systems. It was very much a "thriving" civilisation.' Then around 2100 BC, a transformation began. Streets went uncleaned, buildings started to be abandoned, and ritual structures fell out of use. After their final demise, a millennium passed before really large-scale cities appeared once more in South Asia.

C Some have claimed that major glacier-fed rivers changed their course, dramatically affecting the water supply and agriculture; or that the cities could not cope with an increasing population, they exhausted their resource base, the trading economy broke down or they succumbed to invasion and conflict; and yet others that climate change caused an environmental change that affected food and water provision. 'It is unlikely that there was a single cause for the decline of the civilisation. But the fact is, until now, we have had little solid evidence from the area for most of the key elements,' said Petrie. 'A lot of the archaeological debate has really only been well- argued speculation.'

D A research team led by Petrie, together with Dr Ravindanath Singh of Banaras Hindu University in India, found early in their investigations that many of the archaeological sites were not where they were supposed to be, completely altering understanding of the way that this region was inhabited in the past. When they carried out a survey of how the larger area was settled in relation to sources of water, they found inaccuracies in the published geographic locations of ancient settlements ranging from several hundred metres to many kilometres. They realised that any attempts to use the existing data were likely to be fundamentally flawed. Over the course of several seasons of fieldwork they carried out new surveys, finding an astonishing 198 settlement sites that were previously unknown.

E Now, research published by Dr Yama Dixit and Professor David Hodell, both from Cambridge's Department of Earth Sciences, has provided the first definitive evidence for climate change affecting the plains of north-western India, where hundreds of Harappan sites are known to have been situated. The researchers gathered shells of Melanoides tuberculata snails from the sediments of an ancient lake and used geochemical analysis as a means of tracing the climate history of the region. 'As today, the major source of water into the lake is likely to have been the summer monsoon,' says Dixit. 'But we have observed that there was an abrupt change about 4,100 years ago, when the amount of evaporation from the lake exceeded the rainfall - indicative of a drought.' Hodell

adds: 'We estimate that the weakening of the Indian summer monsoon climate lasted about 200 years before recovering to the previous conditions, which we still see today.'

F It has long been thought that other great Bronze Age civilisations also declined at a similar time, with a global-scale climate event being seen as the cause. While it is possible that these local-scale processes were linked, the real archaeological interest lies in understanding the impact of these larger-scale events on different environments and different populations. 'Considering the vast area of the Harappan Civilisation with its variable weather systems,' explains Singh, 'it is essential that we obtain more climate data from areas close to the two great cities at Mohenjodaro and Harappa and also from the Indian Punjab.'

G Petrie and Singh's team is now examining archaeological records and trying to understand details of how people led their lives in the region five millennia ago. They are analysing grains cultivated at the time, and trying to work out whether they were grown under extreme conditions of water stress, and whether they were adjusting the combinations of crops they were growing for different weather systems. They are also looking at whether the types of pottery used, and other aspects of their material culture, were distinctive to specific regions or were more similar across larger areas. This gives us insight into the types of interactive networks that the population was involved in, and whether those changed.

H Petrie believes that archaeologists are in a unique position to investigate how past societies responded to environmental and climatic change. 'By investigating responses to environmental pressures and threats, we can learn from the past to engage with the public, and the relevant governmental and administrative bodies, to be more proactive in issues such as the management and administration of water supply, the balance of urban and rural development, and the importance of preserving cultural heritage in the future.'

Questions 27-31:

Reading Passage 3 has eight paragraphs, **A-H**.

Which paragraph contains the following information?

*Write the correct letter, **A–H**, in boxes 27-31 on your answer sheet.*

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

27. proposed explanations for the decline of the Harappan Civilisation

28. reference to a present-day application of some archaeological research findings

29. a difference between the Harappan Civilisation and another culture of the same period

30. a description of some features of Harappan urban design

31. reference to the discovery of errors made by previous archaeologists

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BÀI 7: CAMBRIDGE IELTS 13 - TEST 4 - READING PASSAGE 2

SAVING THE SOIL

More than a third of the Earth's top layer is at risk. Is there hope for our planet's most precious resource?

A More than a third of the world's soil is endangered, according to a recent UN report. If we don't slow the decline, all farmable soil could be gone in 60 years. Since soil grows 95% of our food, and sustains human life in other more surprising ways, that is a huge problem.

B Peter Groffman, from the Cary Institute of Ecosystem Studies in New York, points out that soil scientists have been warning about the degradation of the world's soil for decades. At the same time, our understanding of its importance to humans has grown. A single gram of healthy soil might contain 100 million bacteria, as well as other microorganisms such as viruses and fungi, living amid decomposing plants and various minerals.

That means soils do not just grow our food, but are the source of nearly all our existing antibiotics, and could be our best hope in the fight against antibiotic-resistant bacteria. Soil is also an ally against climate change: as microorganisms within soil digest dead animals and plants, they lock in their carbon content, holding three times the amount of carbon as does the entire atmosphere. Soils also store water, preventing flood damage: in the UK, damage to buildings, roads and bridges from floods caused by soil degradation costs £233 million every year.

C If the soil loses its ability to perform these functions, the human race could be in big trouble. The danger is not that the soil will disappear completely, but that the microorganisms that give it its special properties will be lost. And once this has happened, it may take the soil thousands of years to recover.

Agriculture is by far the biggest problem. In the wild, when plants grow they remove nutrients from the soil, but then when the plants die and decay these nutrients are returned directly to the soil. Humans tend not to return unused parts of harvested crops directly to the soil to enrich it, meaning that the soil gradually becomes less fertile. In the past we developed strategies to get around the problem, such as regularly varying the types of crops grown, or leaving fields uncultivated for a season.

D But these practices became inconvenient as populations grew and agriculture had to be run on more commercial lines. A solution came in the early 20th century with the Haber-Bosch process for manufacturing ammonium nitrate. Farmers have been putting this synthetic fertiliser on their fields ever since.

But over the past few decades, it has become clear this wasn't such a bright idea. Chemical fertilisers can release polluting nitrous oxide into the atmosphere and excess is often washed away with the rain, releasing nitrogen into rivers. More recently, we have found that indiscriminate use of fertilisers hurts the soil itself, turning it acidic and salty, and degrading the soil they are supposed to nourish.

E One of the people looking for a solution to this problem is Pius Floris, who started out running a tree-care business in the Netherlands, and now advises some of the world's top soil scientists. He came to realise that the best way to ensure his trees flourished was to take care of the soil, and has developed a cocktail of beneficial bacteria, fungi and humus* to do this. Researchers at the University of Valladolid in Spain recently used this cocktail on soils destroyed by years of

fertiliser overuse. When they applied Floris's mix to the desert-like test plots, a good crop of plants emerged that were not just healthy at the surface, but had roots strong enough to pierce dirt as hard as rock. The few plants that grew in the control plots, fed with traditional fertilisers, were small and weak.

F However, measures like this are not enough to solve the global soil degradation problem. To assess our options on a global scale we first need an accurate picture of what types of soil are out there, and the problems they face. That's not easy. For one thing, there is no agreed international system for classifying soil. In an attempt to unify the different approaches, the UN has created the Global Soil Map project. Researchers from nine countries are working together to create a map linked to a database that can be fed measurements from field surveys, drone surveys, satellite imagery, lab analyses and so on to provide real-time data on the state of the soil. Within the next four years, they aim to have mapped soils worldwide to a depth of 100 metres, with the results freely accessible to all.

G But this is only a first step. We need ways of presenting the problem that bring it home to governments and the wider public, says Pamela Chasek at the International Institute for Sustainable Development, in Winnipeg, Canada. 'Most scientists don't speak language that policy-makers can understand, and vice versa. Chasek and her colleagues have proposed a goal of 'zero net land degradation'. Like the idea of carbon neutrality, it is an easily understood target that can help shape expectations and encourage action.

For soils on the brink, that may be too late. Several researchers are agitating for the immediate creation of protected zones for endangered soils. One difficulty here is defining what these areas should conserve: areas where the greatest soil diversity is present? Or areas of unspoilt soils that could act as a future benchmark of quality?

Whatever we do, if we want our soils to survive, we need to take action now.

** Humus: the part of the soil formed from dead plant material*

Questions 22-26:

Reading Passage 2 has seven paragraphs, **A-G**.

Which section contains the following information?

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

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

22. a reference to one person's motivation for a soil-improvement project

23. an explanation of how soil stayed healthy before the development of farming

24. examples of different ways of collecting information on soil degradation

25. a suggestion for a way of keeping some types of soil safe in the near future

26. a reason why it is difficult to provide an overview of soil degradation

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BÀI 8: CAMBRIDGE IELTS 14 - TEST 1 - READING PASSAGE 2

The growth of bike-sharing schemes around the world

How Dutch engineer Luud Schimmelpennink helped to devise urban bike-sharing schemes

A The original idea for an urban bike-sharing scheme dates back to a summer's day in Amsterdam in 1965. Provo, the organisation that came up with the idea, was a group of Dutch activists who wanted to change society. They believed the scheme, which was known as the Witte Fietsenplan, was an answer to the perceived threats of air pollution and consumerism. In the centre of Amsterdam, they painted a small number of used bikes white. They also distributed leaflets describing the dangers of cars and inviting people to use the white bikes. The bikes were then left unlocked at various locations around the city, to be used by anyone in need of transport.

B Luud Schimmelpennink, a Dutch industrial engineer who still lives and cycles in Amsterdam, was heavily involved in the original scheme. He recalls how the scheme succeeded in attracting a great deal of attention - particularly when it came to publicising Provo's aims - but struggled to get off the ground. The police were opposed to Provo's initiatives and almost as soon as the white bikes were distributed around the city, they removed them. However, for Schimmelpennink and for bike-sharing schemes in general, this was just the beginning. 'The first Witte Fietsenplan was just a symbolic thing,' he says. 'We painted a few bikes white, that was all. Things got more serious when I became a member of the Amsterdam city council two years later.'

C Schimmelpennink seized this opportunity to present a more elaborate Witte Fietsenplan to the city council. 'My idea was that the municipality of Amsterdam would distribute 10,000 white bikes over the city, for everyone to use,' he explains. 'I made serious calculations. It turned out that a white bicycle - per person, per kilometre - would cost the municipality only 10% of what it contributed to public transport per person per kilometre.' Nevertheless, the council unanimously rejected the plan. 'They said that the bicycle belongs to the past. They saw a glorious future for the car,' says Schimmelpennink. But he was not in the least discouraged.

D Schimmelpennink never stopped believing in bike-sharing, and in the mid-90s, two Danes asked for his help to set up a system in Copenhagen. The result was the world's first large-scale bike-share programme. It worked on a deposit: 'You dropped a coin in the bike and when you returned it, you got your money back.' After setting up the Danish system, Schimmelpennink decided to try his luck again in the Netherlands - and this time he succeeded in arousing the interest of the Dutch Ministry of Transport. 'Times had changed,' he recalls. 'People had become more environmentally conscious, and the Danish experiment had proved that bike-sharing was a real possibility.' A new Witte Fietsenplan was launched in 1999 in Amsterdam. However, riding a white bike was no longer free; it cost one guilder per trip and payment was made with a chip card developed by the Dutch bank Postbank. Schimmelpennink designed conspicuous, sturdy white bikes locked in special racks which could be opened with the chip card - the plan started with 250 bikes, distributed over five stations.

E Theo Molenaar, who was a system designer for the project, worked alongside Schimmelpennink. 'I remember when we were testing the bike racks, he announced that he had already designed better ones. But of course, we had to go through with the ones we had.' The system, however, was prone to vandalism and theft. 'After every weekend there would always be a couple of bikes missing,' Molenaar says. 'I really have no idea what people did with them, because they could

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instantly be recognised as white bikes.' But the biggest blow came when Postbank decided to abolish the chip card, because it wasn't profitable. 'That chip card was pivotal to the system,' Molenaar says. 'To continue the project we would have needed to set up another system, but the business partner had lost interest.'

F Schimmelpennink was disappointed, but - characteristically - not for long. In 2002 he got a call from the French advertising corporation JC Decaux, who wanted to set up his bike-sharing scheme in Vienna. 'That went really well. After Vienna, they set up a system in Lyon. Then in 2007, Paris followed. That was a decisive moment in the history of bike-sharing.' The huge and unexpected success of the Parisian bike-sharing programme, which now boasts more than 20,000 bicycles, inspired cities all over the world to set up their own schemes, all modelled on Schimmelpennink's. 'It's wonderful that this happened,' he says. 'But financially I didn't really benefit from it, because I never filed for a patent.

G In Amsterdam today, 38% of all trips are made by bike and, along with Copenhagen, it is regarded as one of the two most cycle-friendly capitals in the world - but the city never got another Witte Fietsenplan. Molenaar believes this may be because everybody in Amsterdam already has a bike. Schimmelpennink, however, cannot see that this changes Amsterdam's need for a bike-sharing scheme. 'People who travel on the underground don't carry their bikes around. But often they need additional transport to reach their final destination.' Although he thinks it is strange that a city like Amsterdam does not have a successful bikesharing scheme, he is optimistic about the future. 'In the '60s we didn't stand a chance because people were prepared to give their lives to keep cars in the city. But that mentality has totally changed. Today everybody longs for cities that are not dominated by cars.'

Questions 14-18:

Reading Passage 2 has seven paragraphs, **A-G**.

Which paragraph contains the following information?

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

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

14. a description of how people misused a bike-sharing scheme

15. an explanation of why a proposed bike-sharing scheme was turned down

16. a reference to a person being unable to profit from their work

17. an explanation of the potential savings a bike-sharing scheme would bring

18. a reference to the problems a bike-sharing scheme was intended to solve

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BÀI 9: CAMBRIDGE IELTS 14 - TEST 2 - READING PASSAGE 2

Back to the future of skyscraper design

Answers to the problem of excessive electricity use by skyscrapers and large public buildings can be found in ingenious but forgotten architectural designs of the 19th and early-20th centuries

A The Recovery of Natural Environments in Architecture by Professor Alan Short is the culmination of 30 years of research and award-winning green building design by Short and colleagues in Architecture, Engineering, Applied Maths and Earth Sciences at the University of Cambridge.

'The crisis in building design is already here,' said Short. 'Policy makers think you can solve energy and building problems with gadgets. You can't. As global temperatures continue to rise, we are going to continue to squander more and more energy on keeping our buildings mechanically cool until we have run out of capacity.

B Short is calling for a sweeping reinvention of how skyscrapers and major public buildings are designed - to end the reliance on sealed buildings which exist solely via the 'life support' system of vast air conditioning units.

Instead, he shows it is entirely possible to accommodate natural ventilation and cooling in large buildings by looking into the past, before the widespread introduction of air conditioning systems, which were 'relentlessly and aggressively marketed' by their inventors.

C Short points out that to make most contemporary buildings habitable, they have to be sealed and air conditioned. The energy use and carbon emissions this generates is spectacular and largely unnecessary. Buildings in the West account for 40-50% of electricity usage, generating substantial carbon emissions, and the rest of the world is catching up at a frightening rate. Short regards glass, steel and air-conditioned skyscrapers as symbols of status, rather than practical ways of meeting our requirements.

D Short's book highlights a developing and sophisticated art and science of ventilating buildings through the 19th and earlier-20th centuries, including the design of ingeniously ventilated hospitals. Of particular interest were those built to the designs of John Shaw Billings, including the first Johns Hopkins Hospital in the US city of Baltimore (1873-1889).

'We spent three years digitally modelling Billings' final designs,' says Short. 'We put pathogens in the airstreams, modelled for someone with tuberculosis (TB) coughing in the wards and we found the ventilation systems in the room would have kept other patients safe from harm.

E 'We discovered that 19th-century hospital wards could generate up to 24 air changes an hour - that's similar to the performance of a modern-day, computer-controlled operating theatre. We believe you could build wards based on these principles now.

Single rooms are not appropriate for all patients. Communal wards appropriate for certain patients - older people with dementia, for example - would work just as well in today's hospitals, at a fraction of the energy cost.

Professor Short contends the mindset and skill-sets behind these designs have been completely lost, lamenting the disappearance of expertly designed theatres, opera houses, and other buildings where up to half the volume of the building was given over to ensuring everyone got fresh air.

F Much of the ingenuity present in 19th-century hospital and building design was driven by a panicked public clamouring for buildings that could protect against what was thought to be the lethal threat of miasmas - toxic air that spread disease. Miasmas were feared as the principal agents of disease and epidemics for centuries, and were used to explain the spread of infection from the Middle Ages right through to the cholera outbreaks in London and Paris during the 1850s. Foul air, rather than germs, was believed to be the main driver of 'hospital fever', leading to disease and frequent death. The prosperous steered clear of hospitals.

While miasma theory has been long since disproved, Short has for the last 30 years advocated a return to some of the building design principles produced in its wake.

G Today, huge amounts of a building's space and construction cost are given over to air conditioning. 'But I have designed and built a series of buildings over the past three decades which have tried to reinvent some of these ideas and then measure what happens.

'To go forward into our new low-energy, low-carbon future, we would be well advised to look back at design before our high-energy, high-carbon present appeared. What is surprising is what a rich legacy we have abandoned.'

H Successful examples of Short's approach include the Queen's Building at De Montfort University in Leicester. Containing as many as 2,000 staff and students, the entire building is naturally ventilated, passively cooled and naturally lit, including the two largest auditoria, each seating more than 150 people. The award-winning building uses a fraction of the electricity of comparable buildings in the UK.

Short contends that glass skyscrapers in London and around the world will become a liability over the next 20 or 30 years if climate modelling predictions and energy price rises come to pass as expected.

I He is convinced that sufficiently cooled skyscrapers using the natural environment can be produced in almost any climate. He and his team have worked on hybrid buildings in the harsh climates of Beijing and Chicago - built with natural ventilation assisted by back-up air conditioning - which, surprisingly perhaps, can be switched off more than half the time on milder days and during the spring and autumn.

Short looks at how we might reimagine the cities, offices and homes of the future. Maybe it's time we changed our outlook.

**pathogens: microorganisms that can cause disease*

Questions 14-18:

Reading Passage 2 has nine sections, **A-I**.

Which section contains the following information?

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

14. why some people avoided hospitals in the 19th century

15. a suggestion that the popularity of tall buildings is linked to prestige

16. a comparison between the circulation of air in a 19th-century building and modern standards

17. how Short tested the circulation of air in a 19th-century building

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18. an implication that advertising led to the large increase in the use of air conditioning

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BÀI 10: CAMBRIDGE IELTS 14 - TEST 3 - READING PASSAGE 1

The concept of intelligence

A Looked at in one way, everyone knows what intelligence is; looked at in another way, no one does. In other words, people all have unconscious notions - known as 'implicit theories' - of intelligence, but no one knows for certain what it actually is. This chapter addresses how people conceptualize intelligence, whatever it may actually be.

But why should we even care what people think intelligence is, as opposed only to valuing whatever it actually is? There are at least four reasons people's conceptions of intelligence matter.

B First, implicit theories of intelligence drive the way in which people perceive and evaluate their own intelligence and that of others. To better understand the judgments people make about their own and others' abilities, it is useful to learn about people's implicit theories. For example, parents' implicit theories of their children's language development will determine at what ages they will be willing to make various corrections in their children's speech. More generally, parents' implicit theories of intelligence will determine at what ages they believe their children are ready to perform various cognitive tasks. Job interviewers will make hiring decisions on the basis of their implicit theories of intelligence. People will decide who to be friends with on the basis of such theories. In sum, knowledge about implicit theories of intelligence is important because this knowledge is so often used by people to make judgments in the course of their everyday lives.

C Second, the implicit theories of scientific investigators ultimately give rise to their explicit theories. Thus it is useful to find out what these implicit theories are. Implicit theories provide a framework that is useful in defining the general scope of a phenomenon - especially a not-well-understood phenomenon. These implicit theories can suggest what aspects of the phenomenon have been more or less attended to in previous investigations.

D Third, implicit theories can be useful when an investigator suspects that existing explicit theories are wrong or misleading. If an investigation of implicit theories reveals little correspondence between the extant implicit and explicit theories, the implicit theories may be wrong. But the possibility also needs to be taken into account that the explicit theories are wrong and in need of correction or supplementation. For example, some implicit theories of intelligence suggest the need for expansion of some of our explicit theories of the construct.

E Finally, understanding implicit theories of intelligence can help elucidate developmental and cross-cultural differences. As mentioned earlier, people have expectations for intellectual performances that differ for children of different ages. How these expectations differ is in part a function of culture. For example, expectations for children who participate in

F Western-style schooling are almost certain to be different from those for children who do not participate in such schooling. I have suggested that there are three major implicit theories of how intelligence relates to society as a whole (Sternberg, 1997). These might be called Hamiltonian, Jeffersonian, and Jacksonian. These views are not based strictly, but rather, loosely, on the philosophies of Alexander Hamilton, Thomas Jefferson, and Andrew Jackson, three great statesmen in the history of the United States.

G The Hamiltonian view, which is similar to the Platonic view, is that people are born with different levels of intelligence and that those who are less intelligent need the good offices of the more intelligent to keep them in line, whether they are called government officials or, in Plato's term,

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philosopher-kings. Herrnstein and Murray (1994) seem to have shared this belief when they wrote about the emergence of a cognitive (high-IQ) elite, which eventually would have to take responsibility for the largely irresponsible masses of non-elite (low-IQ) people who cannot take care of themselves. Left to themselves, the unintelligent would create, as they always have created, a kind of chaos.

H The Jeffersonian view is that people should have equal opportunities, but they do not necessarily avail themselves equally of these opportunities and are not necessarily equally rewarded for their accomplishments. People are rewarded for what they accomplish, if given equal opportunity. Low achievers are not rewarded to the same extent as high achievers. In the Jeffersonian view, the goal of education is not to favor or foster an elite, as in the Hamiltonian tradition, but rather to allow children the opportunities to make full use of the skills they have. My own views are similar to these (Sternberg, 1997).

I The Jacksonian view is that all people are equal, not only as human beings but in terms of their competencies - that one person would serve as well as another in government or on a jury or in almost any position of responsibility. In this view of democracy, people are essentially intersubstitutable except for specialized skills, all of which can be learned. In this view, we do not need or want any institutions that might lead to favoring one group over another.

J Implicit theories of intelligence and of the relationship of intelligence to society perhaps need to be considered more carefully than they have been because they often serve as underlying presuppositions for explicit theories and even experimental designs that are then taken as scientific contributions. Until scholars are able to discuss their implicit theories and thus their assumptions, they are likely to miss the point of what others are saying when discussing their explicit theories and their data.

Questions 1-3:

Reading Passage 1 has ten sections, **A-J**.

Which section contains the following information?

*Write the correct letter, **A-J**, in boxes 1-3 on your answer sheet.*

1. information about how non-scientists' assumptions about intelligence influence their behaviour towards others

2. a reference to lack of clarity over the definition of intelligence

3. the point that a researcher's implicit and explicit theories may be very different

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BÀI 11: CAMBRIDGE IELTS 14 - TEST 3 - READING PASSAGE 2

Saving bugs to find new drugs

Zoologist Ross Piper looks at the potential of insects in pharmaceutical research

A More drugs than you might think are derived from, or inspired by, compounds found in living things. Looking to nature for the soothing and curing of our ailments is nothing new – we have been doing it for tens of thousands of years. You only have to look at other primates – such as the capuchin monkeys who rub themselves with toxin-oozing millipedes to deter mosquitoes, or the chimpanzees who use noxious forest plants to rid themselves of intestinal parasites – to realise that our ancient ancestors too probably had a basic grasp of medicine.

B Pharmaceutical science and chemistry built on these ancient foundations and perfected the extraction, characterisation, modification and testing of these natural products. Then, for a while, modern pharmaceutical science moved its focus away from nature and into the laboratory, designing chemical compounds from scratch. The main cause of this shift is that although there are plenty of promising chemical compounds in nature, finding them is far from easy. Securing sufficient numbers of the organism in question, isolating and characterising the compounds of interest, and producing large quantities of these compounds are all significant hurdles.

C Laboratory-based drug discovery has achieved varying levels of success, something which has now prompted the development of new approaches focusing once again on natural products. With the ability to mine genomes for useful compounds, it is now evident that we have barely scratched the surface of nature's molecular diversity. This realisation, together with several looming health crises, such as antibiotic resistance, has put bioprospecting – the search for useful compounds in nature – firmly back on the map.

D Insects are the undisputed masters of the terrestrial domain, where they occupy every possible niche. Consequently, they have a bewildering array of interactions with other organisms, something which has driven the evolution of an enormous range of very interesting compounds for defensive and offensive purposes. Their remarkable diversity exceeds that of every other group of animals on the planet combined. Yet even though insects are far and away the most diverse animals in existence, their potential as sources of therapeutic compounds is yet to be realised.

E From the tiny proportion of insects that have been investigated, several promising compounds have been identified. For example, alloferon, an antimicrobial compound produced by blow fly larvae, is used as an antiviral and antitumor agent in South Korea and Russia. The larvae of a few other insect species are being investigated for the potent antimicrobial compounds they produce. Meanwhile, a compound from the venom of the wasp Polybia paulista has potential in cancer treatment.

F Why is it that insects have received relatively little attention in bioprospecting? Firstly, there are so many insects that, without some manner of targeted approach, investigating this huge variety of species is a daunting task. Secondly, insects are generally very small, and the glands inside them that secrete potentially useful compounds are smaller still. This can make it difficult to obtain sufficient quantities of the compound for subsequent testing. Thirdly, although we consider insects to be everywhere, the reality of this ubiquity is vast numbers of a few extremely common species. Many insect species are infrequently encountered and very difficult to rear in captivity, which, again, can leave us with insufficient material to work with.

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G My colleagues and I at Aberystwyth University in the UK have developed an approach in which we use our knowledge of ecology as a guide to target our efforts. The creatures that particularly interest us are the many insects that secrete powerful poison for subduing prey and keeping it fresh for future consumption. There are even more insects that are masters of exploiting filthy habitats, such as faeces and carcasses, where they are regularly challenged by thousands of microorganisms. These insects have many antimicrobial compounds for dealing with pathogenic bacteria and fungi, suggesting that there is certainly potential to find many compounds that can serve as or inspire new antibiotics.

H Although natural history knowledge points us in the right direction, it doesn't solve the problems associated with obtaining useful compounds from insects. Fortunately, it is now possible to snip out the stretches of the insect's DNA that carry the codes for the interesting compounds and insert them into cell lines that allow larger quantities to be produced. And although the road from isolating and characterising compounds with desirable qualities to developing a commercial product is very long and full of pitfalls, the variety of successful animal-derived pharmaceuticals on the market demonstrates there is a precedent here that is worth exploring.

I With every bit of wilderness that disappears, we deprive ourselves of potential medicines. As much as I'd love to help develop a groundbreaking insect-derived medicine, my main motivation for looking at insects in this way is conservation. I sincerely believe that all species, however small and seemingly insignificant, have a right to exist for their own sake. If we can shine a light on the darker recesses of nature's medicine cabinet, exploring the useful chemistry of the most diverse animals on the planet, I believe we can make people think differently about the natural world.

Questions 14-20:

Reading Passage 2 has nine paragraphs, A-I.

Which paragraph contains the following information?

*Write the correct letter, **A-I**, in boxes 14-20 on your answer sheet.*

14. mention of factors driving a renewed interest in natural medicinal compounds

15. how recent technological advances have made insect research easier

16. examples of animals which use medicinal substances from nature

17. reasons why it is challenging to use insects in drug research

18. reference to how interest in drug research may benefit wildlife

19. a reason why nature-based medicines fell out of favour for a period

20. an example of an insect-derived medicine in use at the moment

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BÀI 12: CAMBRIDGE IELTS 14 - TEST 4 - READING PASSAGE 2

Why zoos are good

Scientist David Hone makes the case for zoos

A In my view, it is perfectly possible for many species of animals living in zoos or wildlife parks to have a quality of life as high as, or higher than, in the wild. Animals in good zoos get a varied and high-quality diet with all the supplements required, and any illnesses they might have will be treated. Their movement might be somewhat restricted, but they have a safe environment in which to live, and they are spared bullying and social ostracism by others of their kind. They do not suffer from the threat or stress of predators, or the irritation and pain of parasites or injuries. The average captive animal will have a greater life expectancy compared with its wild counterpart, and will not die of drought, of starvation or in the jaws of a predator. A lot of very nasty things happen to truly 'wild' animals that simply don't happen in good zoos, and to view a life that is 'free' as one that is automatically 'good' is, I think, an error. Furthermore, zoos serve several key purposes.

B Firstly, zoos aid conservation. Colossal numbers of species are becoming extinct across the world, and many more are increasingly threatened and therefore risk extinction. Moreover, some of these collapses have been sudden, dramatic and unexpected, or were simply discovered very late in the day. A species protected in captivity can be bred up to provide a reservoir population against a population crash or extinction in the wild. A good number of species only exist in captivity, with many of these living in zoos. Still more only exist in the wild because they have been reintroduced from zoos, or have wild populations that have been boosted by captive bred animals. Without these efforts there would be fewer species alive today. Although reintroduction successes are few and far between, the numbers are increasing, and the very fact that species have been saved or reintroduced as a result of captive breeding proves the value of such initiatives.

C Zoos also provide education. Many children and adults, especially those in cities, will never see a wild animal beyond a fox or pigeon. While it is true that television documentaries are becoming ever more detailed and impressive, and many natural history specimens are on display in museums, there really is nothing to compare with seeing a living creature in the flesh, hearing it, smelling it, watching what it does and having the time to absorb details. That alone will bring a greater understanding and perspective to many, and hopefully give them a greater appreciation for wildlife, conservation efforts and how they can contribute.

D In addition to this, there is also the education that can take place in zoos through signs, talks and presentations which directly communicate information to visitors about the animals they are seeing and their place in the world. This was an area where zoos used to be lacking, but they are now increasingly sophisticated in their communication and outreach work. Many zoos also work directly to educate conservation workers in other countries, or send their animal keepers abroad to contribute their knowledge and skills to those working in zoos and reserves, thereby helping to improve conditions and reintroductions all over the world.

E Zoos also play a key role in research. If we are to save wild species and restore and repair ecosystems we need to know about how key species live, act and react. Being able to undertake research on animals in zoos where there is less risk and fewer variables means real changes can be effected on wild populations. Finding out about, for example, the oestrus cycle of an animal or its breeding rate helps us manage wild populations. Procedures such as capturing and moving at-risk or

dangerous individuals are bolstered by knowledge gained in zoos about doses for anaesthetics, and by experience in handling and transporting animals. This can make a real difference to conservation efforts and to the reduction of human–animal conflicts, and can provide a knowledge base for helping with the increasing threats of habitat destruction and other problems.

F In conclusion, considering the many ongoing global threats to the environment, it is hard for me to see zoos as anything other than essential to the long-term survival of numerous species. They are vital not just in terms of protecting animals, but as a means of learning about them to aid those still in the wild, as well as educating and informing the general population about these animals and their world so that they can assist or at least accept the need to be more environmentally conscious. Without them, the world would be, and would increasingly become, a much poorer place.

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. a reference to how quickly animal species can die out

15. reasons why it is preferable to study animals in captivity rather than in the wild

16. mention of two ways of learning about animals other than visiting them in zoos

17. reasons why animals in zoos may be healthier than those in the wild

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BÀI 13: CAMBRIDGE IELTS 15 - TEST 1 - READING PASSAGE 2

Why zoos are good

A The automotive sector is well used to adapting to automation in manufacturing. The implementation of robotic car manufacture from the 1970s onwards led to significant cost savings and improvements in the reliability and flexibility of vehicle mass production. A new challenge to vehicle production is now on the horizon and, again, it comes from automation. However, this time it is not to do with the manufacturing process, but with the vehicles themselves.

Research projects on vehicle automation are not new. Vehicles with limited self-driving capabilities have been around for more than 50 years, resulting in significant contributions towards driver assistance systems. But since Google announced in 2010 that it had been trialling self-driving cars on the streets of California, progress in this field has quickly gathered pace.

B There are many reasons why technology is advancing so fast. One frequently cited motive is safety; indeed, research at the UK's Transport Research Laboratory has demonstrated that more than 90 percent of road collisions involve human error as a contributory factor, and it is the primary cause in the vast majority. Automation may help to reduce the incidence of this.

Another aim is to free the time people spend driving for other purposes. If the vehicle can do some or all of the driving, it may be possible to be productive, to socialise or simply to relax while automation systems have responsibility for safe control of the vehicle. If the vehicle can do the driving, those who are challenged by existing mobility models – such as older or disabled travellers – may be able to enjoy significantly greater travel autonomy.

C Beyond these direct benefits, we can consider the wider implications for transport and society, and how manufacturing processes might need to respond as a result. At present, the average car spends more than 90 percent of its life parked. Automation means that initiatives for car-sharing become much more viable, particularly in urban areas with significant travel demand. If a significant proportion of the population choose to use shared automated vehicles, mobility demand can be met by far fewer vehicles.

D The Massachusetts Institute of Technology investigated automated mobility in Singapore, finding that fewer than 30 percent of the vehicles currently used would be required if fully automated car sharing could be implemented. If this is the case, it might mean that we need to manufacture far fewer vehicles to meet demand.

However, the number of trips being taken would probably increase, partly because empty vehicles would have to be moved from one customer to the next.

Modelling work by the University of Michigan Transportation Research Institute suggests automated vehicles might reduce vehicle ownership by 43 percent, but that vehicles' average annual mileage would double as a result. As a consequence, each vehicle would be used more intensively, and might need replacing sooner. This faster rate of turnover may mean that vehicle production will not necessarily decrease.

E Automation may prompt other changes in vehicle manufacture. If we move to a model where consumers are tending not to own a single vehicle but to purchase access to a range of vehicles through a mobility provider, drivers will have the freedom to select one that best suits their needs for a particular journey, rather than making a compromise across all their requirements.

Since, for most of the time, most of the seats in most cars are unoccupied, this may boost production of a smaller, more efficient range of vehicles that suit the needs of individuals. Specialised vehicles may then be available for exceptional journeys, such as going on a family camping trip or helping a son or daughter move to university.

F There are a number of hurdles to overcome in delivering automated vehicles to our roads. These include the technical difficulties in ensuring that the vehicle works reliably in the infinite range of traffic, weather and road situations it might encounter; the regulatory challenges in understanding how liability and enforcement might change when drivers are no longer essential for vehicle operation; and the societal changes that may be required for communities to trust and accept automated vehicles as being a valuable part of the mobility landscape.

G It's clear that there are many challenges that need to be addressed but, through robust and targeted research, these can most probably be conquered within the next 10 years. Mobility will change in such potentially significant ways and in association with so many other technological developments, such as telepresence and virtual reality, that it is hard to make concrete predictions about the future. However, one thing is certain: change is coming, and the need to be flexible in response to this will be vital for those involved in manufacturing the vehicles that will deliver future mobility.

Questions 14-18:

Reading Passage 2 has seven sections, **A–G**.

Which section contains the following information?

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

14. Reference to the amount of time when a car is not in use

15. mention of several advantages of driverless vehicles for individual road-users

16. R eference to the opportunity of choosing the most appropriate vehicle for each trip

17. an estimate of how long it will take to overcome a number of problems

18. a suggestion that the use of driverless cars may have no effect on the number of vehicles manufactured

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BÀI 14: CAMBRIDGE IELTS 15 - TEST 2 - READING PASSAGE 1

Could urban engineers learn from dance?

A The way we travel around cities has a major impact on whether they are sustainable. Transportation is estimated to account for 30% of energy consumption in most of the world's most developed nations, so lowering the need for energy-using vehicles is essential for decreasing the environmental impact of mobility. But as more and more people move to cities, it is important to think about other kinds of sustainable travel too. The ways we travel affect our physical and mental health, our social lives, our access to work and culture, and the air we breathe. Engineers are tasked with changing how we travel round cities through urban design, but the engineering industry still works on the assumptions that led to the creation of the energy-consuming transport systems we have now: the emphasis placed solely on efficiency, speed, and quantitative data. We need radical changes, to make it healthier, more enjoyable, and less environmentally damaging to travel around cities.

B Dance might hold some of the answers. That is not to suggest everyone should dance their way to work, however healthy and happy it might make us, but rather that the techniques used by choreographers to experiment with and design movement in dance could provide engineers with tools to stimulate new ideas in city-making. Richard Sennett, an influential urbanist and sociologist who has transformed ideas about the way cities are made, argues that urban design has suffered from a separation between mind and body since the introduction of the architectural blueprint.

C Whereas medieval builders improvised and adapted construction through their intimate knowledge of materials and personal experience of the conditions on a site, building designs are now conceived and stored in media technologies that detach the designer from the physical and social realities they are creating. While the design practices created by these new technologies are essential for managing the technical complexity of the modern city, they have the drawback of simplifying reality in the process.

D To illustrate, Sennett discusses the Peachtree Center in Atlanta, USA, a development typical of the modernist approach to urban planning prevalent in the 1970s. Peachtree created a grid of streets and towers intended as a new pedestrian-friendly downtown for Atlanta. According to Sennett, this failed because its designers had invested too much faith in computer-aided design to tell them how it would operate. They failed to take into account that purpose-built street cafés could not operate in the hot sun without the protective awnings common in older buildings, and would need energy-consuming air conditioning instead, or that its giant car park would feel so unwelcoming that it would put people off getting out of their cars. What seems entirely predictable and controllable on screen has unexpected results when translated into reality.

E The same is true in transport engineering, which uses models to predict and shape the way people move through the city. Again, these models are necessary, but they are built on specific world views in which certain forms of efficiency and safety are considered and other experiences of the city ignored. Designs that seem logical in models appear counter-intuitive in the actual experience of their users. The guard rails that will be familiar to anyone who has attempted to cross a British road, for example, were an engineering solution to pedestrian safety based on models that prioritise the smooth flow of traffic. On wide major roads, they often guide pedestrians to specific crossing points and slow down their progress across the road by using staggered access points to divide the crossing into two – one for each carriageway. In doing so they make crossings feel longer, introducing psychological barriers greatly impacting those that are the least mobile, and encouraging others to make dangerous

crossings to get around the guard rails. These barriers don't just make it harder to cross the road: they divide communities and decrease opportunities for healthy transport. As a result, many are now being removed, causing disruption, cost, and waste.

F If their designers had had the tools to think with their bodies – like dancers – and imagine how these barriers would feel, there might have been a better solution. In order to bring about fundamental changes to the ways we use our cities, engineering will need to develop a richer understanding of why people move in certain ways, and how this movement affects them. Choreography may not seem an obvious choice for tackling this problem. Yet it shares with engineering the aim of designing patterns of movement within limitations of space. It is an art form developed almost entirely by trying out ideas with the body, and gaining instant feedback on how the results feel. Choreographers have deep understanding of the psychological, aesthetic, and physical implications of different ways of moving.

G Observing the choreographer Wayne McGregor, cognitive scientist David Kirsh described how he 'thinks with the body'. Kirsh argues that by using the body to simulate outcomes, McGregor is able to imagine solutions that would not be possible using purely abstract thought. This kind of physical knowledge is valued in many areas of expertise, but currently has no place in formal engineering design processes. A suggested method for transport engineers is to improvise design solutions and get instant feedback about how they would work from their own experience of them, or model designs at full scale in the way choreographers experiment with groups of dancers. Above all, perhaps, they might learn to design for emotional as well as functional effects.

Questions 1-6:

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

Which paragraph contains the following information?

*Write the correct letter, **A–G**, in boxes 1–6 on your answer sheet.*

1. reference to an appealing way of using dance that the writer is not proposing

2. an example of a contrast between past and present approaches to building

3. mention of an objective of both dance and engineering

4. reference to an unforeseen problem arising from ignoring the climate

5. why some measures intended to help people are being reversed

6. reference to how transport has an impact on human lives

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BÀI 15: CAMBRIDGE IELTS 15 - TEST 2 - READING PASSAGE 2

Should we try to bring extinct species back to life?

A The passenger pigeon was a legendary species. Flying in vast numbers across North America, with potentially many millions within a single flock, their migration was once one of nature's great spectacles. Sadly, the passenger pigeon's existence came to an end on 1 September 1914, when the last living specimen died at Cincinnati Zoo. Geneticist Ben Novak is lead researcher on an ambitious project which now aims to bring the bird back to life through a process known as 'de-extinction'. The basic premise involves using cloning technology to turn the DNA of extinct animals into a fertilised embryo, which is carried by the nearest relative still in existence – in this case, the abundant band-tailed pigeon – before being born as a living, breathing animal. Passenger pigeons are one of the pioneering species in this field, but they are far from the only ones on which this cutting-edge technology is being trialled.

B In Australia, the thylacine, more commonly known as the Tasmanian tiger, is another extinct creature which genetic scientists are striving to bring back to life. 'There is no carnivore now in Tasmania that fills the niche which thylacines once occupied,' explains Michael Archer of the University of New South Wales. He points out that in the decades since the thylacine went extinct, there has been a spread in a 'dangerously debilitating' facial tumour syndrome which threatens the existence of the Tasmanian devils, the island's other notorious resident. Thylacines would have prevented this spread because they would have killed significant numbers of Tasmanian devils. 'If that contagious cancer had popped up previously, it would have burned out in whatever region it started. The return of thylacines to Tasmania could help to ensure that devils are never again subjected to risks of this kind.'

C If extinct species can be brought back to life, can humanity begin to correct the damage it has caused to the natural world over the past few millennia? 'The idea of de-extinction is that we can reverse this process, bringing species that no longer exist back to life,' says Beth Shapiro of University of California Santa Cruz's Genomics Institute. 'I don't think that we can do this. There is no way to bring back something that is 100 per cent identical to a species that went extinct a long time ago.' A more practical approach for long-extinct species is to take the DNA of existing species as a template, ready for the insertion of strands of extinct animal DNA to create something new; a hybrid, based on the living species, but which looks and/or acts like the animal which died out.

D This complicated process and questionable outcome begs the question: what is the actual point of this technology? 'For us, the goal has always been replacing the extinct species with a suitable replacement,' explains Novak. 'When it comes to breeding, band-tailed pigeons scatter and make maybe one or two nests per hectare, whereas passenger pigeons were very social and would make 10,000 or more nests in one hectare.' Since the disappearance of this key species, ecosystems in the eastern US have suffered … This has left forests stagnant and therefore unwelcoming to the plants and animals which evolved to help regenerate the forest after a disturbance. According to Novak, a hybridised band-tailed pigeon, with the added nesting habits of a passenger pigeon, could, in theory, re-establish that forest disturbance, thereby creating a habitat necessary for a great many other native species to thrive.

E Another popular candidate for this technology is the woolly mammoth. George Church, professor at Harvard Medical School and leader of the Woolly Mammoth Revival Project, has been focusing on cold resistance, the main way in which the extinct woolly mammoth and its nearest living

relative, the Asian elephant, differ. By pinpointing which genetic traits made it possible for mammoths to survive the icy climate of the tundra, the project's goal is to return mammoths, or a mammoth-like species, to the area. 'My highest priority would be preserving the endangered Asian elephant,' says Church, 'expanding their range to the huge ecosystem of the tundra. Necessary adaptations would include smaller ears, thicker hair, and extra insulating fat, all for the purpose of reducing heat loss in the tundra, and all traits found in the now extinct woolly mammoth.' This repopulation of the tundra and boreal forests of Eurasia and North America with large mammals could also help reduce carbon emissions – elephants punch holes through snow and knock down trees, which encourages grass growth. This grass growth would reduce temperatures and mitigate emissions from melting permafrost.

F While the prospect of bringing extinct animals back to life might capture imaginations, it is, of course, far easier to try to save an existing species which is merely threatened with extinction. 'Many of the technologies that people have in mind when they think about de-extinction can be used as a form of "genetic rescue",' explains Shapiro. She prefers to focus the debate on how this emerging technology could be used to understand why various species went extinct in the first place, and therefore how we could use it to make genetic modifications which could prevent mass extinctions in the future. 'I would also say there's an incredible moral hazard to not do anything at all,' she continues. 'We know that what we are doing today is not enough, and we have to be willing to take some calculated and measured risks.'

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.*

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

14. a reference to how further disappearance of multiple species could be avoided

15. explanation of a way of reproducing an extinct animal using the DNA of only that species

16. reference to a habitat which has suffered following the extinction of a species

17. mention of the exact point at which a particular species became extinct

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BÀI 16: CAMBRIDGE IELTS 16 - TEST 3 - READING PASSAGE 2

Climate change reveals ancient artefacts in Norway's glaciers

A Well above the treeline in Norway's highest mountains, ancient fields of ice are shrinking as Earth's climate warms. As the ice has vanished, it has been giving up the treasures it has preserved in cold storage for the last 6,000 years - items such as ancient arrows and skis from Viking Age* traders. And those artefacts have provided archaeologists with some surprising insights into how ancient Norwegians made their livings.

B Organic materials like textiles and hides are relatively rare finds at archaeological sites. This is because unless they're protected from the microorganisms that cause decay, they tend not to last long. Extreme cold is one reliable way to keep artefacts relatively fresh for a few thousand years, but once thawed out, these materials experience degradation relatively swiftly.

With climate change shrinking ice cover around the world, glacial archaeologists need to

race the clock to find newly revealed artefacts, preserve them, and study them. If something

fragile dries and is windblown it might very soon be lost to science, or an arrow might be exposed and then covered again by the next snow and remain well-preserved. The unpredictability means that glacial archaeologists have to be systematic in their approach to fieldwork.

C Over a nine-year period, a team of archaeologists, which included Lars Pilø of Oppland County Council, Norway, and James Barrett of the McDonald Institute for Archaeological Research, surveyed patches of ice in Oppland, an area of south-central Norway that is home to some of the country's highest mountains. Reindeer once congregated on these icy patches in the later summer months to escape biting insects, and from the late Stone Age**, hunters followed. In addition, trade routes threaded through the mountain passes of Oppland, linking settlements in Norway to the rest of Europe. The slow but steady movement of glaciers tends to destroy anything at their bases, so the team focused on stationary patches of ice, mostly above 1,400 metres. That ice is found amid fields of frost-weathered boulders, fallen rocks, and exposed bedrock that for nine months of the year is buried beneath snow.

'Fieldwork is hard work - hiking with all our equipment, often camping on permafrost -

but very rewarding. You're rescuing the archaeology, bringing the melting ice to wider attention, discovering a unique environmental history and really connecting with the natural environment,' says Barrett.

D At the edges of the contracting ice patches, archaeologists found more than 2,000 artefacts, which formed a material record that ran from 4,000 BCE to the beginnings of the Renaissance in the 14th century. Many of the artefacts are associated with hunting. Hunters would have easily misplaced arrows and they often discarded broken bows rather than take them all the way home. Other items could have been used by hunters traversing the high mountain passes of Oppland: all-purpose items like tools, skis, and horse tack.

E Barrett's team radiocarbon-dated 153 of the artefacts and compared those dates to the timing of major environmental changes in the region - such as periods of cooling or warming - and major social and economic shifts - such as the growth of farming settlements and the spread of international trade networks leading up to the Viking Age. They found that some periods had produced lots of

artefacts, which indicates that people had been pretty active in the mountains during those times. But there were few or no signs of activity during other periods.

F What was surprising, according to Barrett, was the timing of these periods. Oppland's mountains present daunting terrain and in periods of extreme cold, glaciers could block the higher mountain passes and make travel in the upper reaches of the mountains extremely difficult. Archaeologists assumed people would stick to lower elevations during a time like the Late Antique Little Ice Age, a short period of deeper-than-usual cold from about 536-600 CE. But it turned out that hunters kept regularly venturing into the mountains even when the climate turned cold, based on the amount of stuff they had apparently dropped there.

'Remarkably, though, the finds from the ice may have continued through this period, perhaps suggesting that the importance of mountain hunting increased to supplement failing agricultural harvests in times of low temperatures,' says Barrett. A colder turn in the Scandinavian climate would likely have meant widespread crop failures, so more people would have depended on hunting to make up for those losses.

G Many of the artefacts Barrett's team recovered date from the beginning of the Viking Age, the 700s through to the 900s CE. Trade networks connecting Scandinavia with Europe and the Middle East were expanding around this time. Although we usually think of ships when we think of Scandinavian expansion, these recent discoveries show that plenty of goods travelled on overland routes, like the mountain passes of Oppland. And growing Norwegian towns, along with export markets, would have created a booming demand for hides to fight off the cold, as well as antlers to make useful things like combs. Business must have been good for hunters.

H Norway's mountains are probably still hiding a lot of history - and prehistory - in remote ice patches. When Barrett's team looked at the dates for their sample of 153 artefacts, they noticed a gap with almost no artefacts from about 3,800 to 2,200 BCE. In fact, archaeological finds from that period are rare all over Norway. The researchers say that could be because many of those artefacts have already disintegrated or are still frozen in the ice. That means archaeologists could be extracting some of those artefacts from retreating ice in years to come.

**Viking Age: a period of European history from around 700 CE to around 1050 CE when Scandinavian Vikings migrated throughout Europe by means of trade and warfare*

*** The Stone Age: a period in early history that began about 3.4 million years ago*

Questions 14–19:

Reading Passage 2 has eight sections, **A–H**.

Which section contains the following information?

*Write the correct letter, **A–H**, in boxes 14–19 on your answer sheet.*

14. an explanation for weapons being left behind in the mountains

15. a reference to the physical difficulties involved in an archaeological expedition

16. an explanation of why less food may have been available

17. a reference to the possibility of future archaeological discoveries

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18. examples of items that would have been traded

19. a reference to the pressure archaeologists are under to work quickly

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BÀI 17: CAMBRIDGE IELTS 16 - TEST 3 - READING PASSAGE 3

Plant ‘thermometer' triggers springtime growth by measuring night-time heat

A photoreceptor molecule in plant cells has been found to have a second job as a thermometer after dark - allowing plants to read seasonal temperature changes. Scientists say the discovery could help breed crops that are more resilient to the temperatures expected to result from climate change

A An international team of scientists led by the University of Cambridge has discovered that the 'thermometer' molecule in plants enables them to develop according to seasonal temperature changes. Researchers have revealed that molecules called phytochromes - used by plants to detect light during the day - actually change their function in darkness to become cellular temperature gauges that measure the heat of the night.

The new findings, published in the journal Science, show that phytochromes control

genetic switches in response to temperature as well as light to dictate plant development.

B At night, these molecules change states, and the pace at which they change is 'directly proportional to temperature', say scientists, who compare phytochromes to mercury in a thermometer. The warmer it is, the faster the molecular change - stimulating plant growth.

C Farmers and gardeners have known for hundreds of years how responsive plants are to temperature: warm winters cause many trees and flowers to bud early, something humans have long used to predict weather and harvest times for the coming year. The latest research pinpoints for the first time a molecular mechanism in plants that reacts to temperature - often triggering the buds of spring we long to see at the end of winter.

D With weather and temperatures set to become ever more unpredictable due to climate change, researchers say the discovery that this light-sensing molecule also functions as the internal thermometer in plant cells could help us breed tougher crops. 'It is estimated that agricultural yields will need to double by 2050, but climate change is a major threat to achieving this. Key crops such as wheat and rice are sensitive to high temperatures. Thermal stress reduces crop yields by around 10% for every one degree increase in temperature,' says lead researcher Dr Philip Wigge from Cambridge's Sainsbury Laboratory. 'Discovering the molecules that allow plants to sense temperature has the potential to accelerate the breeding of crops resilient to thermal stress and climate change.'

E In their active state, phytochrome molecules bind themselves to DNA to restrict plant growth. During the day, sunlight activates the molecules, slowing down growth. If a plant finds itself in shade, phytochromes are quickly inactivated - enabling it to grow faster to find sunlight again. This is how plants compete to escape each other's shade. 'Light-driven changes to phytochrome activity occur very fast, in less than a second,' says Wigge.

At night, however, it's a different story. Instead of a rapid deactivation following sundown, the molecules gradually change from their active to inactive state. This is called 'dark reversion'. 'Just as mercury rises in a thermometer, the rate at which phytochromes revert to their inactive state during the night is a direct measure of temperature,' says Wigge.

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F 'The lower the temperature, the slower the rate at which phytochromes revert to inactivity, so the molecules spend more time in their active, growth-suppressing state. This is why plants are slower to grow in winter. Warm temperatures accelerate dark reversion, so that phytochromes rapidly reach an inactive state and detach themselves from the plant's DNA - allowing genes to be expressed and plant growth to resume.' Wigge believes phytochrome thermo-sensing evolved at a later stage, and co-opted the biological network already used for light-based growth during the downtime of night.

G Some plants mainly use day length as an indicator of the season. Other species, such as daffodils, have considerable temperature sensitivity, and can flower months in advance during a warm winter. In fact, the discovery of the dual role of phytochromes provides the science behind a well-known rhyme long used to predict the coming season: oak before ash we'll have a splash, ash before oak we're in for a soak. Wigge explains: 'Oak trees rely much more on temperature, likely using phytochromes as thermometers to dictate development, whereas ash trees rely on measuring day length to determine their seasonal timing. A warmer spring, and consequently a higher likeliness of a hot summer, will result in oak leafing before ash. A cold spring will see the opposite. As the British know only too well, a colder summer is likely to be a rain-soaked one.

H The new findings are the culmination of twelve years of research involving scientists from Germany, Argentina and the US, as well as the Cambridge team. The work was done in a model system, using a mustard plant called Arabidopsis, but Wigge says the phytochrome genes necessary for temperature sensing are found in crop plants as well. 'Recent advances in plant genetics now mean that scientists are able to rapidly identify the genes controlling these processes in crop plants, and even alter their activity using precise molecular "scalpels",' adds Wigge. 'Cambridge is uniquely well-positioned to do this kind of research as we have outstanding collaborators nearby who work on more applied aspects of plant biology, and can help us transfer this new knowledge into the field.'

Questions 33–37:

Reading Passage 3 has eight sections, **A–H**.

Which section contains the following information?

*Write the correct letter, **A–H**, in boxes 33–37 on your answer sheet.*

33. mention of specialists who can make use of the research findings

34. a reference to a potential benefit of the research findings

35. scientific support for a traditional saying

36. a reference to people traditionally making plans based on plant behaviour

37. a reference to where the research has been reported

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BÀI 18: CAMBRIDGE IELTS 17 - TEST 1 - READING PASSAGE 2

Stadiums: past, present and future

A Stadiums are among the oldest forms of urban architecture: vast stadiums where the public could watch sporting events were at the centre of western city life as far back as the ancient Greek and Roman Empires, well before the construction of the great medieval cathedrals and the grand 19th- and 20th-century railway stations which dominated urban skylines in later eras.

Today, however, stadiums are regarded with growing scepticism. Construction costs can soar above £1 billion, and stadiums finished for major events such as the Olympic Games or the FIFA World Cup have notably fallen into disuse and disrepair.

But this need not be the case. History shows that stadiums can drive urban development and adapt to the culture of every age. Even today, architects and planners are finding new ways to adapt the mono-functional sports arenas which became emblematic of modernisation during the 20th century.

B The amphitheatre* of Arles in southwest France, with a capacity of 25,000 spectators, is perhaps the best example of just how versatile stadiums can be. Built by the Romans in 90 AD, it became a fortress with four towers after the fifth century, and was then transformed into a village containing more than 200 houses. With the growing interest in conservation during the 19th century, it was converted back into an arena for the staging of bullfights, thereby returning the structure to its original use as a venue for public spectacles.

Another example is the imposing arena of Verona in northern Italy, with space for 30,000 spectators, which was built 60 years before the Arles amphitheatre and 40 years before Rome's famous Colosseum. It has endured the centuries and is currently considered one of the world's prime sites for opera, thanks to its outstanding acoustics.

C The area in the centre of the Italian town of Lucca, known as the Piazza dell'Anfiteatro, is yet another impressive example of an amphitheatre becoming absorbed into the fabric of the city. The site evolved in a similar way to Arles and was progressively filled with buildings from the Middle Ages until the 19th century, variously used as houses, a salt depot and a prison. But rather than reverting to an arena, it became a market square, designed by Romanticist architect Lorenzo Nottolini. Today, the ruins of the amphitheatre remain embedded in the various shops and residences surrounding the public square.

D There are many similarities between modern stadiums and the ancient amphitheatres

intended for games. But some of the flexibility was lost at the beginning of the 20th century, as stadiums were developed using new products such as steel and reinforced concrete, and made use of bright lights for night-time matches.

Many such stadiums are situated in suburban areas, designed for sporting use only and surrounded by parking lots. These factors mean that they may not be as accessible to the general public, require more energy to run and contribute to urban heat.

E But many of today's most innovative architects see scope for the stadium to help improve the city. Among the current strategies, two seem to be having particular success: the stadium as an urban hub, and as a power plant.

There's a growing trend for stadiums to be equipped with public spaces and services that serve a function beyond sport, such as hotels, retail outlets, conference centres, restaurants and bars,

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children's playgrounds and green space. Creating mixed-use developments such as this reinforces compactness and multi-functionality, making more efficient use of land and helping to regenerate urban spaces.

This opens the space up to families and a wider cross-section of society, instead of catering only to sportspeople and supporters. There have been many examples of this in the UK: the mixed-use facilities at Wembley and Old Trafford have become a blueprint for many other stadiums in the world.

F The phenomenon of stadiums as power stations has arisen from the idea that energy problems can be overcome by integrating interconnected buildings by means of a smart grid, which is an electricity supply network that uses digital communications technology to detect and react to local changes in usage, without significant energy losses. Stadiums are ideal for these purposes, because their canopies have a large surface area for fitting photovoltaic panels and rise high enough (more than 40 metres) to make use of micro wind turbines.

Freiburg Mage Solar Stadium in Germany is the first of a new wave of stadiums as power plants, which also includes the Amsterdam Arena and the Kaohsiung Stadium. The latter, inaugurated in 2009, has 8,844 photovoltaic panels producing up to 1.14 GWh of electricity annually. This reduces the annual output of carbon dioxide by 660 tons and supplies up to 80 percent of the surrounding area when the stadium is not in use. This is proof that a stadium can serve its city, and have a decidedly positive impact in terms of reduction of CO2 emissions.

G Sporting arenas have always been central to the life and culture of cities. In every era, the stadium has acquired new value and uses: from military fortress to residential village, public space to theatre and most recently a field for experimentation in advanced engineering. The stadium of today now brings together multiple functions, thus helping cities to create a sustainable future.

** amphitheatre: (especially in Greek and Roman architecture) an open circular or oval building with a central space surrounded by tiers of seats for spectators, for the presentation of dramatic or sporting events*

Questions 14–17:

Reading Passage 2 has seven sections, **A–G**.

Which section contains the following information?

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

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

14. a mention of negative attitudes towards stadium building projects

15. figures demonstrating the environmental benefits of a certain stadium

16. examples of the wide range of facilities available at some new stadiums

17. reference to the disadvantages of the stadiums built during a certain era

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BÀI 19: CAMBRIDGE IELTS 17 - TEST 2 - READING PASSAGE 2

A second attempt at domesticating the tomato

A It took at least 3,000 years for humans to learn how to domesticate the wild tomato and cultivate it for food. Now two separate teams in Brazil and China have done it all over again in less than three years. And they have done it better in some ways, as the re-domesticated tomatoes are more nutritious than the ones we eat at present.

This approach relies on the revolutionary CRISPR genome editing technique, in which changes are deliberately made to the DNA of a living cell, allowing genetic material to be added, removed or altered. The technique could not only improve existing crops, but could also be used to turn thousands of wild plants into useful and appealing foods. In fact, a third team in the US has already begun to do this with a relative of the tomato called the groundcherry.

This fast-track domestication could help make the world's food supply healthier and far more resistant to diseases, such as the rust fungus devastating wheat crops.

'This could transform what we eat,' says Jorg Kudla at the University of Munster in Germany, a member of the Brazilian team. 'There are 50,000 edible plants in the world, but 90 percent of our energy comes from just 15 crops.'

'We can now mimic the known domestication course of major crops like rice, maize, sorghum or others,' says Caixia Gao of the Chinese Academy of Sciences in Beijing. 'Then we might try to domesticate plants that have never been domesticated.'

B Wild tomatoes, which are native to the Andes region in South America, produce pea-sized fruits. Over many generations, peoples such as the Aztecs and Incas transformed the plant by selecting and breeding plants with mutations in their genetic structure, which resulted in desirable traits such as larger fruit.

But every time a single plant with a mutation is taken from a larger population for breeding, much genetic diversity is lost. And sometimes the desirable mutations come with less desirable traits. For instance, the tomato strains grown for supermarkets have lost much of their flavour.

By comparing the genomes of modern plants to those of their wild relatives, biologists have been working out what genetic changes occurred as plants were domesticated. The teams in Brazil and China have now used this knowledge to reintroduce these changes from scratch while maintaining or even enhancing the desirable traits of wild strains.

C Kudla's team made six changes altogether. For instance, they tripled the size of fruit by editing a gene called FRUIT WEIGHT, and increased the number of tomatoes per truss by editing another called MULTIFLORA.

While the historical domestication of tomatoes reduced levels of the red pigment lycopene – thought to have potential health benefits – the team in Brazil managed to boost it instead. The wild tomato has twice as much lycopene as cultivated ones; the newly domesticated one has five times as much.

'They are quite tasty,' says Kudla. 'A little bit strong. And very aromatic.'

The team in China re-domesticated several strains of wild tomatoes with desirable traits lost in domesticated tomatoes. In this way they managed to create a strain resistant to a common disease

called bacterial spot race, which can devastate yields. They also created another strain that is more salt tolerant – and has higher levels of vitamin C.

D Meanwhile, Joyce Van Eck at the Boyce Thompson Institute in New York state decided to use the same approach to domesticate the groundcherry or goldenberry (Physalis pruinosa) for the first time. This fruit looks similar to the closely related Cape gooseberry (Physalis peruviana).

Groundcherries are already sold to a limited extent in the US but they are hard to produce because the plant has a sprawling growth habit and the small fruits fall off the branches when ripe. Van Eck's team has edited the plants to increase fruit size, make their growth more compact and to stop fruits dropping. 'There's potential for this to be a commercial crop,' says Van Eck. But she adds that taking the work further would be expensive because of the need to pay for a licence for the CRISPR technology and get regulatory approval.

E This approach could boost the use of many obscure plants, says Jonathan Jones of the Sainsbury Lab in the UK. But it will be hard for new foods to grow so popular with farmers and consumers that they become new staple crops, he thinks.

The three teams already have their eye on other plants that could be 'catapulted into the mainstream', including foxtail, oat-grass and cowpea. By choosing wild plants that are drought or heat tolerant, says Gao, we could create crops that will thrive even as the planet warms.

But Kudla didn't want to reveal which species were in his team's sights, because CRISPR has made the process so easy. 'Anyone with the right skills could go out tomorrow and do this.'

** mutations: changes in an organism's genetic structure that can be passed down to later generations*

Questions 14-18:

Reading Passage 2 has five sections, **A-E**.

Which section contains the following information?

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

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

14. a reference to a type of tomato that can resist a dangerous infection

15. an explanation of how problems can arise from focusing only on a certain type of tomato plant

16. a number of examples of plants that are not cultivated at present but could be useful as food sources

17. a comparison between the early domestication of the tomato and more recent research

18. a personal reaction to the flavour of a tomato that has been genetically edited

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BÀI 20: CAMBRIDGE IELTS 17 - TEST 3 - READING PASSAGE 2

Palm oil

A Palm oil is an edible oil derived from the fruit of the African oil palm tree, and is currently the most consumed vegetable oil in the world. It's almost certainly in the soap we wash with in the morning, the sandwich we have for lunch, and the biscuits we snack on during the day. Why is palm oil so attractive for manufacturers? Primarily because its unique properties – such as remaining solid at room temperature – make it an ideal ingredient for long-term preservation, allowing many packaged foods on supermarket shelves to have 'best before' dates of months, even years, into the future.

B Many farmers have seized the opportunity to maximise the planting of oil palm trees. Between 1990 and 2012, the global land area devoted to growing oil palm trees grew from 6 to 17 million hectares, now accounting for around ten percent of total cropland in the entire world. From a mere two million tonnes of palm oil being produced annually globally 50 years ago, there are now around 60 million tonnes produced every single year, a figure looking likely to double or even triple by the middle of the century.

C However, there are multiple reasons why conservationists cite the rapid spread of oil palm plantations as a major concern. There are countless news stories of deforestation, habitat destruction and dwindling species populations, all as a direct result of land clearing to establish oil palm tree monoculture on an industrial scale, particularly in Malaysia and Indonesia. Endangered species – most famously the Sumatran orangutan, but also rhinos, elephants, tigers, and numerous other fauna – have suffered from the unstoppable spread of oil palm plantations.

D 'Palm oil is surely one of the greatest threats to global biodiversity,' declares Dr Farnon Ellwood of the University of the West of England, Bristol. 'Palm oil is replacing rainforest, and rainforest is where all the species are. That's a problem.' This has led to some radical questions among environmentalists, such as whether consumers should try to boycott palm oil entirely.

Meanwhile Bhavani Shankar, Professor at London's School of Oriental and African Studies, argues, 'It's easy to say that palm oil is the enemy and we should be against it. It makes for a more dramatic story, and it's very influential. But given the complexity of the argument, I think a much more nuanced story is closer to the truth.'

E One response to the boycott movement has been the argument for the vital role palm oil plays in lifting many millions of people in the developing world out of poverty. Is it desirable to have palm oil boycotted, replaced, eliminated from the global supply chain, given how many low-income people in developing countries depend on it for their livelihoods? How best to strike a utilitarian balance between these competing factors has become a serious bone of contention.

F Even the deforestation argument isn't as straightforward as it seems. Oil palm plantations produce at least four and potentially up to ten times more oil per hectare than soybean, rapeseed, sunflower or other competing oils. That immensely high yield – which is predominantly what makes it so profitable – is potentially also an ecological benefit. If ten times more palm oil can be produced from a patch of land than any competing oil, then ten times more land would need to be cleared in order to produce the same volume of oil from that competitor.

As for the question of carbon emissions, the issue really depends on what oil palm trees are replacing. Crops vary in the degree to which they sequester carbon – in other words, the amount of carbon they

capture from the atmosphere and store within the plant. The more carbon a plant sequesters, the more it reduces the effect of climate change. As Shankar explains: '[Palm oil production] actually sequesters more carbon in some ways than other alternatives. […] Of course, if you're cutting down virgin forest it's terrible – that's what's happening in Indonesia and Malaysia, it's been allowed to get out of hand. But if it's replacing rice, for example, it might actually sequester more carbon.'

G The industry is now regulated by a group called the Roundtable on Sustainable Palm Oil (RSPO), consisting of palm growers, retailers, product manufacturers, and other interested parties. Over the past decade or so, an agreement has gradually been reached regarding standards that producers of palm oil have to meet in order for their product to be regarded as officially 'sustainable'. The RSPO insists upon no virgin forest clearing, transparency and regular assessment of carbon stocks, among other criteria. Only once these requirements are fully satisfied is the oil allowed to be sold as certified sustainable palm oil (CSPO). Recent figures show that the RSPO now certifies around 12 million tonnes of palm oil annually, equivalent to roughly 21 percent of the global total.

H There is even hope that oil palm plantations might not need to be such sterile monocultures, or 'green deserts', as Ellwood describes them. New research at Ellwood's lab hints at one plant which might make all the difference. The bird's nest fern (Asplenium nidus) grows on trees in an epiphytic fashion (meaning it's dependent on the tree only for support, not for nutrients), and is native to many tropical regions, where as a keystone species it performs a vital ecological role. Ellwood believes that reintroducing the bird's nest fern into oil palm plantations could potentially allow these areas to recover their biodiversity, providing a home for all manner of species, from fungi and bacteria, to invertebrates such as insects, amphibians, reptiles and even mammals.

Questions 14-20:

Reading Passage 2 has eight sections, **A-H**.

Which section contains the following information?

*Write the correct letter, **A-H**, in boxes 14-20 on your answer sheet.*

14. examples of a range of potential environmental advantages of oil palm tree cultivation

15. description of an organisation which controls the environmental impact of palm oil production

16. examples of the widespread global use of palm oil

17. reference to a particular species which could benefit the ecosystem of oil palm plantations

18. figures illustrating the rapid expansion of the palm oil industry

19. an economic justification for not opposing the palm oil industry

20. examples of creatures badly affected by the establishment of oil palm plantations

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ĐÁP ÁN (KÈM LỜI GIẢI CHI TIẾT)

BÀI 1:

Câu	Đáp án	Giải thích
1	A	Đoạn A: *Two things distinguish food production from all other productive activities...* → Mô tả đặc điểm chỉ riêng ngành sản xuất thực phẩm có.
2	B	Đoạn B: *smallholder farmers in developing countries must in addition deal with adverse environments...* → Chỉ nông dân ở một số khu vực (quốc gia đang phát triển) mới gặp khó khăn này.
3	H	Đoạn H: *Giel Ton warned that collective action does not come as a free good. It takes time, effort and money to organise, build trust and to experiment.* → Khó khăn trong việc hợp tác giữa nông dân.

BÀI 2:

Câu	Đáp án	Giải thích
37	D	Đoạn D: *When monolingual and bilingual adolescents listen to simple speech sounds without any intervening background noise...* → sự khác biệt trong phản ứng não bộ với auditory input.
38	G	Đoạn G: *In one study, researchers taught seven-month-old babies... only the bilingual babies were able to successfully learn the new rule.* → lợi ích xuất hiện trước khi trẻ biết nói.
39	B	Đoạn B: *When we hear a word, we don't hear the entire word all at once...* → mô tả quá trình nhận diện từ ngữ khi nghe.
40	C	Đoạn C: *knowing more than one language can cause speakers to name pictures more slowly, and can increase "tip-of-the-tongue states"...* → các

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		hệ quả tiêu cực của song ngữ.

BÀI 3:

Câu	Đáp án	Giải thích
14	D	Đoạn D: *While people will always be prone to illness, the study of how geography affects our health could lead to the eradication of certain illnesses, and the prevention of others in the future.* → Thừa nhận rằng không thể loại bỏ hoàn toàn bệnh tật.
15	C	Đoạn C: *smog and pollution caused by cars and factories → gây ra asthma, lung problems, eyesight issues.* → Các bệnh lý do hành vi con người (ô nhiễm).
16	F	Đoạn F: *categorising illnesses, diseases and epidemics into local and global scales.* → Phân loại bệnh dựa trên phạm vi địa lý.
17	G	Đoạn G: *very large discrepancy between the options available to people in different social classes, income brackets, and levels of education + difficult for people to get medical attention because there is a mountain between their village and the nearest hospital.* → Lý do vì sao tiếp cận y tế khác nhau trong 1 quốc gia.
18	D	Đoạn D: *Health geography is the combination of, on the one hand, knowledge regarding geography ... and on the other, the study of health, diseases and healthcare practices.* → Mô tả health geography như sự kết hợp nhiều lĩnh vực học thuật.
19	B	Đoạn B: *Malaria is much less of a problem in high-altitude deserts.* → Mô tả nơi mà bệnh hiếm khi xảy ra.

BÀI 4:

Câu	Đáp án	Giải thích

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14	B	Đoạn B: *"The team found that participants who had sniffed oxytocin ... invested more money ... These follow-up studies have shown that after a sniff of the hormone, people become more charitable, better at reading emotions ... and at communicating constructively."* → Chỉ ra tác động tích cực (trust, generosity, empathy, cooperation).
15	F	Đoạn F: *"It's a very simple and ancient molecule ... it affects primitive parts of the brain ... Bartz agrees: Oxytocin probably does some very basic things, but once you add our higher-order thinking and social situations, these processes manifest in different ways depending on individual differences and context."* → Chỉ ra rằng chức năng cơ bản nhưng khi kết hợp với não người và hoàn cảnh xã hội dẫn đến nhiều hiệu ứng khác nhau.
16	B	Đoạn B: *"'For eight years, it was quite a lonesome field,' Heinrichs recalls. 'Now, everyone is interested.'"* → Có một thời gian dài (8 năm) nghiên cứu oxytocin ít người quan tâm.
17	E	Đoạn E: *"Bartz has recently shown that in almost half of the existing research results, oxytocin influenced only certain individuals or in certain circumstances. Where once researchers took no notice of such findings, now ..."* → Trước đây, các nhà nghiên cứu không để ý (ignored) đến dữ liệu "chỉ ảnh hưởng một số người hoặc trong một số hoàn cảnh".

BÀI 5:

Câu	Đáp án	Giải thích
24	F	Đoạn F: *"Another interesting finding was that while the seven-month-olds responded to all speech sounds ... the brains of the older infants worked harder at the motor activations of non-native sounds compared to native sounds."* → Sự thay đổi trong hoạt động não của trẻ trước khi tròn 1 tuổi (11.5 tháng).
25	A	Đoạn A: *"Most babies start developing their hearing while still in the womb ... prompting some hopeful parents to play classical music to their pregnant*

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		bellies." → Hành động của cha mẹ (cho nghe nhạc) với hy vọng mang lợi ích cho bé trước khi sinh.
26	E	Đoạn E: *"They found that the 'infant' sounds held babies' attention nearly 40 percent longer. The baby noises also induced more reactions ..."* → Trẻ thích âm thanh do các bé khác tạo ra hơn so với âm thanh của người lớn.

BÀI 6:

Câu	Đáp án	Giải thích
27	C	Đoạn C: *"Some have claimed that major glacier-fed rivers changed their course… or that the cities could not cope… trading economy broke down… invasion and conflict… climate change…"* → Các giả thuyết/giải thích cho sự suy tàn.
28	H	Đoạn H: *"By investigating responses to environmental pressures and threats, we can learn from the past to engage with the public ... to be more proactive in issues such as the management ... of water supply, the balance of urban and rural development, and the importance of preserving cultural heritage in the future."* → Ứng dụng hiện tại của nghiên cứu khảo cổ.
29	A	Đoạn A: *"But their lack of self-imagery – at a time when the Egyptians were carving and painting representations of themselves…"* → Sự khác biệt giữa Harappan và Ai Cập cùng thời.
30	B	Đoạn B: *"Cities were built that had great baths, craft workshops, palaces and halls… Houses were arranged in blocks, with wide main streets and narrow alleyways, and many had their own wells and drainage systems."* → Mô tả thiết kế đô thị của Harappan.
31	D	Đoạn D: *"...many of the archaeological sites were not where they were supposed to be… inaccuracies in the published geographic locations…"*

		→ Chỉ ra sai sót trong nghiên cứu khảo cổ trước đó.

BÀI 7:

Câu	Đáp án	Giải thích
22	E	Đoạn E: *"Pius Floris ... came to realise that the best way to ensure his trees flourished was to take care of the soil, and has developed a cocktail..."* → Floris làm dự án vì muốn cây của mình phát triển tốt hơn → đây là động lực cá nhân.
23	C	Đoạn C: *"In the wild, when plants grow they remove nutrients ... but when the plants die and decay these nutrients are returned directly to the soil."* → Cách đất duy trì độ màu mỡ tự nhiên trước khi con người canh tác.
24	F	Đoạn F: *"...measurements from field surveys, drone surveys, satellite imagery, lab analyses..."* → Các ví dụ cụ thể về cách thu thập dữ liệu.
25	G	Đoạn G: *"Several researchers are agitating for the immediate creation of protected zones for endangered soils."* → Đề xuất tạo khu bảo vệ cho những loại đất dễ bị tổn hại.
26	F	Đoạn F: *"For one thing, there is no agreed international system for classifying soil."* → Điều này khiến khó có cái nhìn tổng quát.

BÀI 8:

Câu	Đáp án	Giải thích
14	E	Đoạn E: *"The system, however, was prone to vandalism and theft. 'After every weekend there would always be a couple of bikes missing,' Molenaar says. 'I really have no idea what people did with them...'"*

		→ Mô tả việc người dân phá hoại, ăn cắp, sử dụng sai mục đích.
15	C	Đoạn C: *"...the council unanimously rejected the plan. 'They said that the bicycle belongs to the past. They saw a glorious future for the car.'"* → Giải thích tại sao hội đồng thành phố bác bỏ kế hoạch → họ tin vào xe hơi, không tin vào xe đạp.
16	F	Đoạn F: *"'It's wonderful that this happened,' he says. 'But financially I didn't really benefit from it, because I never filed for a patent.'"* → Schimmelpennink không hưởng lợi tài chính từ ý tưởng.
17	C	Đoạn C: *"'It turned out that a white bicycle – per person, per kilometre – would cost the municipality only 10% of what it contributed to public transport per person per kilometre.'"* → Phân tích chi phí tiết kiệm nếu dùng xe đạp công cộng.
18	A	Đoạn A: *"They believed the scheme ... was an answer to the perceived threats of air pollution and consumerism."* → Mục tiêu ban đầu là giải quyết ô nhiễm không khí và chủ nghĩa tiêu dùng.

BÀI 9:

Câu	Đáp án	Giải thích
14	F	Đoạn F: *"Foul air, rather than germs, was believed to be the main driver of 'hospital fever', leading to disease and frequent death. The prosperous steered clear of hospitals."* → Người giàu tránh xa bệnh viện vì sợ "miasma" (khí độc) lây bệnh.
15	C	Đoạn C: *"Short regards glass, steel and air-conditioned skyscrapers as symbols of status, rather than practical ways of meeting our requirements."* → Cao ốc hiện đại được xem là biểu tượng địa vị.
16	E	Đoạn E: *"We discovered that 19th-century hospital wards could generate up to 24 air changes an hour – that's similar to the performance of a modern-day, computer-controlled operating theatre."*

		→ So sánh luân chuyển không khí xưa với chuẩn hiện đại.
17	D	Đoạn D: *"We spent three years digitally modelling Billings' final designs… we put pathogens in the airstreams, modelled for someone with TB coughing in the wards and we found the ventilation systems … would have kept other patients safe."* → Short mô phỏng bằng máy tính và thí nghiệm với vi khuẩn.
18	B	Đoạn B: *"…before the widespread introduction of air conditioning systems, which were 'relentlessly and aggressively marketed' by their inventors."* → Sự bùng nổ điều hòa là do quảng cáo mạnh mẽ.

BÀI 10:

Câu	Đáp án	Giải thích
1	B	Đoạn B: *"Parents' implicit theories of intelligence will determine … Job interviewers will make hiring decisions … People will decide who to be friends with …"* → Người bình thường (non-scientists) áp dụng quan niệm của mình để ứng xử.
2	A	Đoạn A: *"Looked at in one way, everyone knows what intelligence is; looked at in another way, no one does."* → Ý nói không rõ ràng về định nghĩa trí thông minh.
3	D	Đoạn D: *"If an investigation of implicit theories reveals little correspondence between the extant implicit and explicit theories … the explicit theories are wrong and in need of correction …"* → Nêu rõ việc implicit vs explicit theories có thể khác biệt nhiều.

BÀI 11:

Câu	Đáp án	Giải thích

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14	C	Đoạn C: *"... With the ability to mine genomes... we have barely scratched the surface... This realisation, together with several looming health crises, such as antibiotic resistance, has put bioprospecting... firmly back on the map."* → Nhắc đến các yếu tố (genome mining + health crises) khiến hứng thú quay lại.
15	H	Đoạn H: *"... now possible to snip out the stretches of the insect's DNA... insert them into cell lines... allow larger quantities to be produced."* → Công nghệ sinh học mới giúp dễ nghiên cứu hơn.
16	A	Đoạn A: *"capuchin monkeys... rub themselves with toxin-oozing millipedes... chimpanzees... use noxious forest plants..."* → Ví dụ động vật dùng chất tự nhiên chữa bệnh.
17	F	Đoạn F: *"Firstly, there are so many insects that, without some manner of targeted approach, investigating this huge variety of species is a daunting task."* → Quá nhiều loài *"Secondly, insects are generally very small, and the glands inside them that secrete potentially useful compounds are smaller still. This can make it difficult to obtain sufficient quantities of the compound for subsequent testing."* → Cơ thể quá nhỏ *"Thirdly, although we consider insects to be everywhere, the reality of this ubiquity is vast numbers of a few extremely common species. Many insect species are infrequently encountered and very difficult to rear in captivity, which, again, can leave us with insufficient material to work with."* → Khó thu thập / nuôi
18	I	Đoạn I: *"my main motivation... is conservation... If we can shine a light... I believe we can make people think differently about the natural world."* → Nghiên cứu thuốc giúp bảo tồn thiên nhiên.
19	B	Đoạn B: *"... modern pharmaceutical science moved its focus away from nature and into the laboratory, designing chemical compounds from scratch."* → Lý do: tìm hóa chất tự nhiên quá khó.

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20	E	Đoạn E: *"For example, alloferon... is used as an antiviral and antitumor agent in South Korea and Russia."* → Ví dụ thuốc có nguồn gốc từ côn trùng đang sử dụng.

BÀI 12:

Câu	Đáp án	Giải thích
14	B	Đoạn B: *"Colossal numbers of species are becoming extinct… some of these collapses have been sudden, dramatic and unexpected…"* → Nhắc tới việc loài có thể tuyệt chủng rất nhanh → đúng.
15	E	Đoạn E: *"Being able to undertake research on animals in zoos where there is less risk and fewer variables…"* → Giải thích tại sao nghiên cứu trong môi trường nuôi nhốt lại tốt hơn ngoài tự nhiên.
16	C	Đoạn C: *"…television documentaries are becoming ever more detailed and impressive, and many natural history specimens are on display in museums…"* → Hai cách khác để học về động vật ngoài đến thăm sở thú: xem phim tài liệu, xem mẫu vật trong viện bảo tàng.
17	A	Đoạn A: *"Animals in good zoos get a varied and high-quality diet… any illnesses they might have will be treated… spared bullying… not suffer from predators, parasites or injuries…"* → Nêu ra nhiều lý do vì sao động vật trong sở thú có thể khỏe mạnh hơn ngoài tự nhiên.

BÀI 13:

Câu	Đáp án	Giải thích
14	C	Đoạn C: *"At present, the average car spends more than 90 percent of its life parked."*

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		→ Nói về thời gian xe không được sử dụng.
15	B	Đoạn B: *"research at the UK's Transport Research Laboratory has demonstrated that more than 90 percent of road collisions involve human error ... Automation may help to reduce the incidence of this."* → Lợi ích: giảm tai nạn. *"If the vehicle can do the driving, those who are challenged by existing mobility models – such as older or disabled travellers – may be able to enjoy significantly greater travel autonomy."* → Lợi ích: tăng khả năng di chuyển cho người già hoặc khuyết tật.
16	D	Đoạn D: *"drivers will have the freedom to select one that best suits their needs for a particular journey"* → Chọn xe phù hợp nhất cho từng chuyến đi.
17	F	Đoạn F: *"through robust and targeted research, these can most probably be conquered within the next 10 years."* → Ước lượng thời gian để giải quyết các vấn đề.
18	C	Đoạn C: *"This faster rate of turnover may mean that vehicle production will not necessarily decrease."* → Số lượng xe sản xuất có thể không giảm.

BÀI 14:

Câu	Đáp án	Giải thích
1	B	Đoạn B: *"That is not to suggest everyone should dance their way to work, however healthy and happy it might make us..."* → Ở đây có nhắc đến một cách "appealing" (đi làm bằng cách nhảy múa cho khỏe mạnh, vui vẻ) nhưng tác giả không hề đề xuất.
2	C	Đoạn C: *"Whereas medieval builders improvised and adapted construction... building designs are now conceived and stored in media technologies..."* → Nêu ra sự tương phản: ngày xưa (medieval builders) dựa vào kinh nghiệm trực tiếp, còn nay (modern design) dựa vào công nghệ.

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3	F	Đoạn F: *"Choreography may not seem... Yet it shares with engineering the aim of designing patterns of movement within limitations of space."* → Mục tiêu chung: thiết kế chuyển động trong giới hạn không gian.
4	D	Đoạn D: *"They failed to take into account that purpose-built street cafés could not operate in the hot sun without the protective awnings common in older buildings..."* → Vấn đề không ngờ tới phát sinh vì bỏ qua yếu tố khí hậu nóng → thất bại.
5	E	Đoạn E: *"As a result, many are now being removed, causing disruption, cost, and waste."* → Ban đầu guard rails được thiết kế để an toàn → nhưng thực tế lại gây hại (chia cắt cộng đồng, cản trở) → nên phải gỡ bỏ.
6	A	Đoạn A: *"The ways we travel affect our physical and mental health, our social lives, our access to work and culture, and the air we breathe."* → Chỉ ra rằng các phương tiện giao thông ảnh hưởng trực tiếp đến đời sống con người.

BÀI 15:

Câu	Đáp án	Giải thích
14	F	Đoạn F: *"... this emerging technology could be used to fully understand why various species went extinct in the first place, and therefore how we could use it to make genetic modifications which could prevent mass extinctions in the future."* → Ý nói công nghệ này giúp ta ngăn chặn việc tuyệt chủng hàng loạt trong tương lai → tránh thêm nhiều loài biến mất.
15	A	Đoạn A: *"Of all the species that have ever lived, more than 99% are now extinct."* → Đây là con số thống kê về số lượng loài đã tuyệt chủng trong lịch sử.
16	D	Đoạn D: *"For instance, scientists could use the genome of the band-tailed pigeon to recreate its extinct relative, the passenger pigeon. They might also*

		study the Asian elephant to help revive the woolly mammoth." → Đưa ví dụ về loài còn tồn tại (band-tailed pigeon, Asian elephant) có thể nghiên cứu để tái tạo loài đã tuyệt chủng.
17	A	Đoạn A: *"... when exactly species vanished is often uncertain, because the evidence is incomplete. Some species thought to be extinct have later been rediscovered."* → Nêu lý do khó xác định: bằng chứng chưa đầy đủ, có loài tưởng tuyệt chủng nhưng thật ra vẫn tồn tại.

BÀI 16:

Câu	Đáp án	Giải thích
14	D	Đoạn D: *"Hunters would have easily misplaced arrows and they often discarded broken bows rather than take them all the way home."* → Lý do vũ khí bị bỏ lại trong núi: hoặc bị đánh rơi (arrows), hoặc bị bỏ đi (bows).
15	C	Đoạn C: *"'Fieldwork is hard work – hiking with all our equipment, often camping on permafrost – but very rewarding…' says Barrett."* → Miêu tả rõ những khó khăn về thể chất trong quá trình khai quật (leo núi với trang thiết bị nặng, cắm trại trên băng vĩnh cửu).
16	F	Đoạn F: *"... perhaps suggesting that the importance of mountain hunting increased to supplement failing agricultural harvests in times of low temperatures... A colder turn ... would likely have meant widespread crop failures."* → Ý nói khí hậu lạnh hơn làm mùa màng thất bát → nguồn thực phẩm ít đi.
17	H	Đoạn H: *"... many of those artefacts have already disintegrated or are still frozen in the ice. That means archaeologists could be extracting some of those artefacts from retreating ice in years to come."* → Nhấn mạnh khả năng có thêm khám phá khảo cổ trong tương lai.
18	G	Đoạn G: *"... booming demand for hides to fight off the cold, as well as antlers to make useful things like combs."*

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		→ Đây là các mặt hàng được trao đổi buôn bán.
19	B	Đoạn B: *"With climate change shrinking ice cover around the world, glacial archaeologists need to race the clock to find newly revealed artefacts, preserve them, and study them."* → "Race the clock" = áp lực phải làm nhanh trước khi hiện vật mất đi.

BÀI 17:

Câu	Đáp án	Giải thích
33	H	Đoạn H: *"Cambridge is uniquely well-positioned… we have outstanding collaborators nearby who work on more applied aspects of plant biology, and can help us transfer this new knowledge into the field."* → Ở đây "applied aspects of plant biology" = các chuyên gia ứng dụng có thể dùng kết quả nghiên cứu.
34	D	Đoạn D: *"Discovering the molecules that allow plants to sense temperature has the potential to accelerate the breeding of crops resilient to thermal stress and climate change."* → Đây là lợi ích tiềm năng của phát hiện khoa học này: tạo giống cây trồng chịu nhiệt tốt hơn.
35	G	Đoạn G: *"In fact, the discovery of the dual role of phytochromes provides the science behind a well-known rhyme … oak before ash we'll have a splash, ash before oak we're in for a soak."* → Đây là bằng chứng khoa học giải thích cho một câu tục ngữ/dự báo truyền thống.
36	C	Đoạn C: *"Farmers and gardeners have known for hundreds of years how responsive plants are to temperature… something humans have long used to predict weather and harvest times for the coming year."* → Con người đã lên kế hoạch (dự báo, mùa vụ) dựa vào hành vi/thời điểm nảy chồi của cây cối.
37	A	Đoạn A: *"The new findings, published in the journal Science, show that phytochromes control genetic switches…"*

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		→ Đây là thông tin về nơi công bố nghiên cứu.

BÀI 18:

Câu	Đáp án	Giải thích
14	A	Đoạn A: *"Today, however, stadiums are regarded with growing scepticism. Construction costs can soar above £1 billion, and stadiums ... have notably fallen into disuse and disrepair."* → Có "scepticism" + chi phí khủng + bị bỏ hoang → thái độ tiêu cực với dự án xây sân vận động.
15	F	Đoạn F: *"8,844 photovoltaic panels producing up to 1.14 GWh of electricity annually… reduces the annual output of carbon dioxide by 660 tons and supplies up to 80 percent of the surrounding area…"* → Đây là số liệu (figures) về lợi ích môi trường.
16	E	Đoạn E: *"…equipped with public spaces and services… hotels, retail outlets, conference centres, restaurants and bars, children's playgrounds and green space."* → Liệt kê nhiều tiện ích đa dạng ngoài thể thao.
17	D	Đoạn D: *"But some of the flexibility was lost at the beginning of the 20th century… suburban areas, designed for sporting use only and surrounded by parking lots… not as accessible… require more energy… contribute to urban heat."* → Nói rõ bất lợi của sân vận động xây thời kỳ đầu thế kỷ 20.

BÀI 19:

Câu	Đáp án	Giải thích
14	C	Đoạn C: *"The team in China re-domesticated several strains of wild tomatoes ... they managed to create a strain resistant to a common disease called bacterial spot race, which can devastate yields."*

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		→ Nhắc rõ loại cà chua có thể chống lại bệnh nguy hiểm.
15	B	Đoạn B: *"But every time a single plant with a mutation is taken from a larger population for breeding, much genetic diversity is lost. ... For instance, the tomato strains grown for supermarkets have lost much of their flavour."* → Giải thích việc chỉ chọn một dòng cà chua gây mất đa dạng di truyền và giảm hương vị.
16	E	Đoạn E: *"The three teams already have their eye on other plants ... including foxtail, oat-grass and cowpea. By choosing wild plants ... we could create crops that will thrive even as the planet warms."* → Nêu nhiều ví dụ về cây chưa được trồng đại trà nhưng có tiềm năng làm nguồn thực phẩm.
17	A	Đoạn A: *"It took at least 3,000 years for humans to learn how to domesticate the wild tomato ... Now two separate teams in Brazil and China have done it all over again in less than three years."* → So sánh trực tiếp giữa thời cổ đại (3,000 years) và nghiên cứu hiện nay (3 years)
18	C	Đoạn C: *"'They are quite tasty,' says Kudla. 'A little bit strong. And very aromatic.'"* → Đây là phản ứng cá nhân về hương vị của loại cà chua đã được chỉnh sửa gen.

BÀI 20:

Câu	Đáp án	Giải thích
14	F	Đoạn F: *"Oil palm plantations produce at least four and potentially up to ten times more oil per hectare ... potentially also an ecological benefit ... [Palm oil production] actually sequesters more carbon in some ways than other alternatives."* → Liệt kê các lợi ích môi trường tiềm năng: hiệu suất cao, ít cần đất hơn, lưu trữ carbon.

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15	G	Đoạn G: *"The industry is now regulated by a group called the Roundtable on Sustainable Palm Oil (RSPO) ... agreement ... no virgin forest clearing, transparency and regular assessment of carbon stocks ..."* → Nói về tổ chức RSPO, chuyên giám sát và kiểm soát tác động môi trường.
16	A	Đoạn A: *"Palm oil is ... currently the most consumed vegetable oil in the world. It's almost certainly in the soap ... the sandwich ... the biscuits ..."* → Ví dụ rõ ràng về sự phổ biến toàn cầu của dầu cọ.
17	H	Đoạn H: *"The bird's nest fern (Asplenium nidus) ... Ellwood believes that reintroducing ... could potentially allow these areas to recover their biodiversity ..."* → Nhắc đến một loài thực vật cụ thể (bird's nest fern) có thể giúp ích cho hệ sinh thái.
18	B	Đoạn B: *"Between 1990 and 2012 ... grew from 6 to 17 million hectares ... from 2 million tonnes ... to around 60 million tonnes ... likely to double or triple ..."* → Đưa số liệu rõ ràng về sự mở rộng nhanh chóng của ngành dầu cọ.
19	E	Đoạn E: *"Palm oil plays [a] vital role ... in lifting many millions of people in the developing world out of poverty ... How best to strike ... livelihoods ..."* → Đây là lý do kinh tế để không phản đối dầu cọ (người nghèo cần nó).
20	C	Đoạn C: *"... large-scale conversion of tropical forests into oil palm plantations has resulted in massive loss of biodiversity. Flagship species such as orangutans and tigers have been badly affected by the destruction of their habitats ..."* → Vừa nói đúng hậu quả tiêu cực, vừa đưa ra loài cụ thể làm ví dụ, nên hoàn toàn đáp ứng yêu cầu của câu hỏi.