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IELTS READING (ACADEMIC)

Actual Tests With Answers

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IELTSMaterial.com

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IELTS Reading Test 1

Section 1

Instructions to follow

- You should spend about 20 minutes on Questions 1-14 which are based on Reading Passage 1

Biology of Bitterness

To many people, grapefruit is palatable only when doused in sugar. Bitter Blockers like adenosine monophosphate could change that.

A. There is a reason why grapefruit juice is served in little glasses: most people don't want to drink more than a few ounces at a time. Naringin, a natural chemical compound found in grapefruit, tastes bitter. Some people like that bitterness in small doses and believe it enhances the general flavor, but others would rather avoid it altogether. So juice packagers often select grapefruit with low naringin though the compound has antioxidant properties that some nutritionists contend may help prevent cancer and arteriosclerosis.

B. It is possible, however, to get the goodness of grapefruit juice without the bitter taste. I found that out by participating in a test conducted at the Linguagen Corporation, a biotechnology company in Cranbury, New Jersey. Sets of two miniature white paper cups, labeled 304and 305, were placed before five people seated around a conference table. Each of us drank from one cup and then the other, cleansing our palates between tastes with water and a soda cracker. Even the smallest sip of 304 had grapefruit 's unmistakable bitter bite. But 305 was smoother; there was the sour taste of citrus but none of the bitterness of naringin. This juice had been treated with adenosine monophosphate, or

AMP, a compound that blocks the bitterness in foods without making them less nutritious.

C. Taste research is a booming business these days, with scientists delving into all five basics-sweet, bitter, sour, salty, and umami, the savory taste of protein. Bitterness is of special interest to industry because of its untapped potential in food. There are thousands of bitter -tasting compounds in nature. They defend plants by warning animals away and protect animals by letting them know when a plant may be poisonous. But the system isn't foolproof. Grapefruit and cruciferous vegetable like Brussels sprouts and kale are nutritious despite-and sometimes because of-their bitter-tasting components. Over time, many people have learned to love them, at least in small doses. "Humans are the only species that enjoys bitter taste," says Charles Zuker, a neuroscientist at the University of California School of Medicine at San Diego. "Every other species is averse to bitter because it means bad news. But we have learned to enjoy it. We drink coffee, which is bitter, and quinine [in tonic water] too. We enjoy having that spice in our lives." Because bitterness can be pleasing in small quantities but repellent when intense, bitter blockers like AMP could make a whole range of foods, drinks, and medicines more palatable-and therefore more profitable.

D. People have varying capacities for tasting bitterness, and the differences appear to be genetic. About 75 percent of people are sensitive to the taste of the bitter compounds phenylthiocarbamide and 6-n-propylthiouracil. and 25 percent are insensitive. Those who are sensitive to phenylthiocarbamide seem to be less likely than others to eat cruciferous vegetables, according to Stephen Wooding, a geneticist at the University of Utah. Some people, known as supertasters, are especially sensitive to 6-n-propylthiouraci because they have an unusually high number of taste buds. Supertasters tend to shun all kinds of bitter-tasting things, including vegetable, coffee, and dark chocolate. Perhaps as a result, they tend to be thin. They're also less fond of alcoholic drinks, which are often slightly

bitter. Dewar's scotch, for instance, tastes somewhat sweet to most people. " But a supertaster tastes no sweetness at all, only bitterness," says Valerie Duffy, an associate professor of dietetics at the University of Connecticut at Storrs.

E. In one recent study, Duffy found that supertasters consume alcoholic beverages, on average, only two to three times a week, compared with five or six times for the average nontasters. Each taste bud, which looks like an onion, consists of 50 to 100 elongated cells running from the top of the bud to the bottom. At the top is a little clump of receptors that capture the taste molecules, known as tastants, in food and drink. The receptors function much like those for sight and smell. Once a bitter signal has been received, it is relayed via proteins known as G proteins. The G protein involved in the perception of bitterness, sweetness, and umami was identified in the early 1990s by Linguagen's founder, Robert Margolskee, at Mount Sinai School of Medicine in New York City. Known as gustducin, the protein triggers a cascade of chemical reactions that lead to changes in ion concentrations within the cell. Ultimately, this delivers a signal to the brain that registers as bitter. "The signaling system is like a bucket brigade," Margolskee says. "It goes from the G protein to other proteins."

F. In 2000 Zuker and others found some 30 different kinds of genes that code for bitter-taste receptors. "We knew the number would have to be large because there is such a large universe of bitter tastants," Zuker says. Yet no matter which tastant enters the mouth or which receptor it attaches to, bitter always tastes the same to us. The only variation derives from its intensity and the ways in which it can be flavored by the sense of smell. "Taste cells are like a light switch," Zuker says. "They are either on or off."

G. Once they figured put the taste mechanism, scientists began to think of ways to interfere with it. They tried AMP, an organic compound found in breast milk and other substances,

which is created as cells break down food. Amp has no bitterness of its own, but when put it in foods, Margolskee and his colleagues discovered, it attaches to bitter-taste receptors. As effective as it is, AMP may not be able to dampen every type pf bitter taste, because it probably doesn't attach to all 30 bitter-taste receptors. So Linguagen has scaled up the hunt for other bitter blockers with a technology called high-throughput screening. Researchers start by coaxing cells in culture to activate bitter-taste receptors. Then candidate substances, culled from chemical compound libraries, are dropped onto the receptors, and scientists look for evidence of a reaction.

H. Tin time, some taste researchers believe, compounds like AMP will help make processed foods less unhealthy. Consider, for example, that a single cup of Campbell's chicken noodle soup contains 850 milligrams of sodium chloride, or table salt-more than a third of the recommended daily allowance. The salt masks the bitterness created by the high temperatures used in the canning process, which cause sugars and amino acids to react. Part of the salt could be replaced by another salt, potassium chloride, which tends to be scarce in some people's diets. Potassium chloride has a bitter aftertaste, but that could be eliminated with a dose of AMP. Bitter blockers could also be used in place of cherry or grape flavoring to take the harshness out of children's cough syrup, and they could dampen the bitterness of antihistamines, antibiotics, certain HIV drugs, and other medications.

I. A number of foodmakers have already begun to experiment with AMP in their products, and other bitter blockers are being developed by rival firms such as Senomyx in La Jolla, California. In a few years, perhaps, after food companies have taken the bitterness from canned soup and TV dinners, they can set their sights on something more useful: a bitter blocker in a bottle that any of us can sprinkle on our brussels sprouts or stir into our grapefruit juice.

Questions 1-8

Instructions to follow

- The reading Passage has seven paragraphs A-I.
- Which paragraph contains the following information?
- Write the correct letter A-I, in boxes 1-8 on your answer sheet.

1. Experiment on bitterness conducted
2. Look into the future application
3. Bitterness means different information for human and animals
4. Spread process of bitterness inside of body
5. How AMP blocks bitterness
6. Some bitterness blocker may help lower unhealthy impact
7. Bitterness introduced from a fruit
8. Genetic feature determines sensitivity

Question 9-12

Summary

Instructions to follow

- Complete the following summary of the paragraphs of Reading Passage, using no more than two words from the Reading Passage for each answer.
- Write your answers in boxes 9-12 on your answer sheet.

The reason why grapefruit tastes bitter is because a substance called __9__ contained in it. However, bitterness plays a significant role for plants. It gives a signal that certain plant is __10__. For human beings, different person carries various genetic abilities of tasting bitterness. According to a scientist at the University of Utah, __11__ have exceptionally plenty of __12__, which allows them to perceive bitter compounds.

Questions 13-14

Instructions to follow

- Choose the correct letter, A, B, C or D.
- Write your answers in boxes 13-14 on your answer sheet.

13 What is the main feature of AMP according to this passage?

A offset bitter flavour in food

B only exist in 304 cup

C tastes like citrus

D chemical reaction when meets biscuit

14 What is the main function of G protein?

A collecting taste molecule

B identifying different flavors elements

A resolving large molecules

D transmitting bitter signals to the brain

Section 2

Instructions to follow

- You should spend about 20 minutes on Questions 15-26 which are based on Reading Passage 2

Franklin's Lost Expedition

A. What could have resulted in the deaths of 129 men and officers aboard the ship in Franklin's lost expedition? The fate of the ship remains a topic of investigation, still intriguing to some international researchers of today. Sir John Franklin and his crew set sail from England in 1845 in search of the Northwest Passage, a sea route that was rumored to connect the continents of Europe and Asia. Two ships, HMS Erebus and HMS Terror, headed the expedition. Franklin's wife, Lady Jane Franklin, had become worried after three years without any communication from the expedition. She then persuaded the government to begin investigating. The sites of the three first search efforts were Lancaster Sound, the Bering Strait and over land beginning at the Mackenzie River.

B. All of these searches, as well as others that followed were unsuccessful in discovering the fate of the crew. Lady Franklin began her own search in 1851, but about a year later, these searches led by McClure and Collinson and their crews also turned up missing. Collinson eventually found his way back to England, while McClure was found and returned back in 1854. That same year, searcher John Rae reported to the Admiralty that according to Inuit information and some discovered items, it seemed that Franklin and the crew had perished. In a desperate last attempt to survive, some may have even taken up cannibalism. Rae was given what would be about $400,000 Canadian dollars today as a

reward. Therefore, it appeared that Admiralty would not pursue any further search efforts.

C. However, Lady Franklin did not give up there, and in 1857 she began commissioning another search with Leopold McClintock as its leader. It was McClintock who found many corpses on King William Island, along with a journal which outlined the journey of Franklin's two ships, Erebus and Terror. On May 1847, it seemed according to the journal that the ships were stuck in ice. Even so, there should have been enough food supplies onboard the ships to last three years. "All well," said the note. Another note from April 25, 1848 made the situation appear more dire. Apparently, the ships had remained stuck in ice for over a year, with several men abandoning the expedition within the days before.

D. Researchers, scientists and historians have continued to ponder this mystery for over 160 years. What had happened which had caused the men to abandon ship, rather than wait for the ice to melt? The Northwest Passage is well-known for its harsh weather and constantly changing sea ice. To the west King William Island, particularly strong gusts of wind howl over layers of thick ice, formed over periods of hundreds of years. How long did the ice trap Franklin's two unfortunate ships so that they could not move?

E. Investigators and researchers continue looking for answers to these questions regarding Franklin's lost expedition, attempting to explain what happened to the captain and his crew. From American explorer Charles Francis Hall in 1860-1863, to Frederick Schwatka in 1879, as well as the Canadian government's search in 1930 and William Gibson's search a year later, some hints were found in the form of human remains, Inuit information and discovered items, but no certain conclusions could be reached. In 1981, along the western coast of King William Island, the University of Alberta-led Franklin Expedition Forensic Anthropology Project dug up human remains. Forensic testing at the time suggested that

the cause of death was likely either lead poisoning and scurvy. Lead poisoning has continued to persist as a possible explanation for the loss of the expedition since then. However, proving this is not so simple, as surgeons' journals (the "sick books") which recorded illness on board have yet to be found.

F. Still without Franklin sick books, a team of researchers from the University of Glasgow took up a study of the sick books of Royal Naval ships which were searching for Franklin. The search ships were equipped similarly, with the same provisions as Franklin's vessels, therefore the team looked over the illnesses and fatalities within the search crews under the assumption that the conditions suffered by those crews could mirror those of the lost expedition.

G. Due to relatively high levels of lead found in some remains of the crew, it has been suggested that lead poisoning from solder that sealed the expedition's canned provisions could explain the lost expedition. However, within the other search ships who had similar provisions, no evidence of lead poisoning was found, despite the relatively high exposure to lead that was unavoidable on ships of the era and within the overall British population. So, unless Franklin’s ships had a particular lead source, there is no substantial proof that lead poisoning had a role in the failed expedition. Across nine search crews, patterns in illnesses led researchers to conclude that Franklin's men would have suffered the same respiratory and gastrointestinal disorders, injuries and exposure, and that some fatalities might have been a result of respiratory, cardiovascular and tubercular conditions. Moreover, the team suggested that the abnormally high number of deaths of Franklin's officers was probably a result of non-medical circumstances such as accidents and injuries that happened when officers accepted the risky responsibility of hunting animals to provide food, or walking over difficult terrain in a severe climate, continuing their attempts at finding the route of a Northwest Passage.

H. It seems possible that the 2016 discovery by the Arctic Research Foundation made recently in the wreck of HMS Terror, along with a discovery two years before in 2014 of HMS Erebus by Parks Canada could finally allow access to some first-hand evidence of medical issues and other factors at play in the failed expedition. If any of the expedition's records in writing have been preserved on board, it's possible they could still be read if they were left in the right underwater conditions. If a 'sick book' has managed to survive aboard a ship, the events that led to the lost expedition may be revealed, allowing those speculating to finally get some closure on the matter.

Questions 15-21

Instructions to follow

- Do the following statements agree with the information given in the reading passage? In boxes 15-21 on your answer sheet, write

- **TRUE** if the statement agrees with the information
- **FALSE** if the statement contradicts the information
- **NOT GIVEN** if there is no information on this.

15 Franklin's lost expedition was a search party attempting to find Lady Jane Franklin

16 John Rae suspected that Franklin's lost expedition likely suffered from a food shortage aboard the ship

17 The leaders of the search parties commissioned by Lady Franklin returned to England after some time

18 It was common for people living Britain during the 19th century to be exposed to lead

19 Most of the crew aboard Franklin's lost expedition were trained to hunt wild animals

20 The most recent research from University of Glasgow suggests that some of leaders of the crew on the Franklin expedition died from lead poisoning.

21 The research into the wreck of HMS Terror may shed light on the mystery of the lost expedition.

Questions 22-26

Instructions to follow

- Complete the sentences below.
- Choose NO MORE THAN THREE WORDS from the passage for each answer.
- Write your answers in 22-26 on your answer sheet.

The Northwest Passage is a route which connects 22 _____ by sea.

As a reward for seemingly having discovered the fate of the Franklin expedition, 23 _____ was given an amount that would equal hundreds of thousands of Canadian dollars today.

Forensic testing available in the 80's suggested that either 24 _____ or lead poisoning led to the deaths of the crew in the Franklin expedition.

The 25 _____ made by doctors aboard the ships in the Franklin expedition still have not been recovered.

Researchers have suggested that the leaders of Franklin's crew might not have been ill, but could have died from 26 _____ as a result of their behaviours.

Section 3

Instructions to follow

- You should spend about 20 minutes on Questions 27-40 which are based on Reading Passage 3

Owl Secrets

A. It always appeared to fly in the face of logic. But now, the biological secrets that allow owls to rotate their heads without cutting off their blood supply have finally been unravelled. Scientists have discovered four major adaptations in owls designed to prevent injury when the animals rotate their overly large heads by up to 270 degrees.

B. The study found that the birds' unique bone structures and vascular systems let them move with increased flexibility. Scientists at John Hopkins University School of Medicine in the US studied snowy, barred and great horned owls after their deaths from natural causes. They found that the vertebral artery enters the neck higher than in other birds, creating more slack. Unlike humans, owls were found to have small vessel connections between the carotid and vertebral arteries, allowing the blood to be exchanged between the two blood vessels. This creates an uninterrupted blood flow to the brain, even if one route is blocked during extreme neck rotation.

C. The adaptation gives the birds a huge range of vision without having to move their bodies and arouse detection by prey. The lack of similar adaptations in humans could explain why humans are more vulnerable to neck injury, the experts concluded. When humans attempt sudden and violent twists of their neck they risk damaging the lining of their

blood vessels, which can result in a fatal blockage or stroke. Study senior investigator Doctor Philippe Gailloud, said: 'Until now, brain imaging specialists like me who deal with human injuries caused by trauma to arteries in the head and neck have always been puzzled as to why rapid, twisting neck movements did not leave thousands of owls lying dead on the forest floor from stroke. 'The carotid and vertebral arteries in the neck of most animals - including owls and humans - are very fragile and highly susceptible to even minor tears of the vessel lining.'

D. To solve the puzzle, the researchers studied the bone and blood vessel structures in the heads and necks of the birds. An injectable contrast dye was used to highlight the birds' blood vessels, which were then dissected, drawn and scanned to allow detailed analysis.

E. The most striking finding came after researchers injected dye into the owls' arteries, mimicking blood flow, and manually turned the animals' heads. They found that when they turned the heads, the blood vessels below the jaw bone expanded as more dye entered, creating pools of blood capable of maintaining the energy supply to the brain and eyes. They showed that the big carotid arteries, instead of being on the side of the neck as in humans, are carried close to the centre of rotation just in front of the spine. As a consequence, these arteries experience much less twisting and turning. The potential for damage is therefore greatly reduced. This contrasted starkly with human anatomical ability, where arteries generally tend to get smaller and smaller, and do not balloon out as they branch out. This creates the risk of clotting after sudden neck movements such as whiplash.

F. Researchers say these contractile blood reservoirs act as a trade-off, allowing birds to pool blood to meet the energy needs of their large brains and eyes, while they rotate their

heads. The supporting vascular network, with its many interconnections and adaptations, helps minimise any interruption in blood flow. The study results demonstrate what physical properties are needed to allow such extreme head movements, and explain why injuries sustained from treatments that involve manipulating bones with the hands such as chiropractic therapy can have such serious consequences for humans. Dr Gailloud added: 'Our new study results show precisely what morphological adaptations are needed to handle such head gyrations and why humans are so vulnerable to bone injury from chiropractic therapy. Extreme manipulations of the human head are really dangerous because we lack so many of the vessel-protecting features seen in owls.'

G. Medical illustrator Fabian de Kok-Mercado said: 'In humans, the vertebral artery really hugs the brains and eyes, while they rotate their heads. The supporting vascular network, with its many interconnections and adaptations, helps minimise any interruption in blood flow. The study results demonstrate what physical properties are needed to allow such extreme head movements, and explain why injuries sustained from treatments that involve manipulating bones with the hands such as chiropractic therapy can have such serious consequences for humans. Dr Gailloud added: 'Our new study results show precisely what morphological adaptations are needed to handle such head gyrations and why humans are hollow cavities in the neck. But this is not the case in owls, whose structures are specially adapted to allow for greater arterial flexibility and movement.' It is a powerful adaptive trait, but it is not unique. Plenty of birds have a similar ability to look behind them. Red tailed hawks for example are almost as flexible as their nocturnal cousins. 'There are lots of advantages to being able to look over your shoulder and see something coming - if you're trying to avoid predators or detect prey', he added.

Question 27-34

Instructions to follow

- Complete the summary using the list of words and phrases **A-M** below.
- Write the correct letter, A-Min boxes 27-34 on your answer sheet.
- **NB** You may use any letter more than once.

How can owls rotate their heads by 27 ..... 270 degrees? The many small bones that make up the neck and spine enable them to achieve 28 ..... movement. A research team has discovered that in 29 ..... ,their vascular network has adapted to make the rotation possible. Owls' carotid arteries are 30 ..... the spine, at the centre of rotation. This means the arteries endure 31 ..... strain when the head is turned. In addition, the vessels 32 ..... their heads can expand, creating reservoirs of blood to supply the brain when the head is turned. And the cavities in the neck vertebrae, through which the vessels pass, are extremely 33 ..... , giving the vessels space to move around when twisted. All this is necessary because their eyes can't move: owls can only look 34 ..... ahead.

A flexible

B as much as

C at the base of

D in front of

E intense

F limited

G far less

H multiple

I in excess of

J to the side of

K various ways

L large

M straight

Questions 35-40

Instructions to follow

- Complete each sentence with the correct ending, **A-H** below.
- Write the correct letter, **A-H** in boxes 35-40 on your answer sheet.

35 The bone structure and circulatory system of owls has evolved in order to

A ○ B ○ C ○ D ○ E ○ F ○ G ○ H ○

36 Humans' arteries tend to

A ○ B ○ C ○ D ○ E ○ F ○ G ○ H ○

37 Scientists injected dye into the blood vessels of dead owls in order to

A ○ B ○ C ○ D ○ E ○ F ○ G ○ H ○

38 When humans attempt sudden twists of their neck they are more likely to

A ○ B ○ C ○ D ○ E ○ F ○ G ○ H ○

39 The backup arteries of owls are designed to

A ○ B ○ C ○ D ○ E ○ F ○ G ○ H ○

40 Owls have a huge range of vision which enables them to

A ○ B ○ C ○ D ○ E ○ F ○ G ○ H ○

A collect any excess blood created in the process of turning.

B cope with their very large heads.

C damage the lining of their blood vessels.

D decrease in size.

E make them lighter.

F mimic natural blood flow.

G Offer a fresh supply of nutrients when blood vessels get closed off.

H avoid detection by predators or to find prey.

IELTS Reading Test 2

Section 1

Instructions to follow

- You should spend about 20 minutes on Questions 1-14 which are based on Reading Passage 1

Synaesthesia

A. Imagine a page with a square box in the middle. The box is lined with rows of the number 5, repeated over and over. All of the 5s are identical in size, font and colour, and equally distributed across the box. There is, however, a trick: among those 5s, hiding in plain sight is a single, capital letter S. Almost the same in shape, it is impossible to spot without straining your eyes for a good few minutes. Unless that is, you are a grapheme – colour synaesthete – a person who sees each letter and number in different colours. With all the 5s painted in one colour and the rogue S painted in another, a grapheme – colour synaesthete will usually only need a split second to identify the latter.

B. Synaesthesia, loosely translated as "senses coming together" from the Greek words syn ("with") and aesthesis ("sensation"), is an interesting neurological phenomenon that causes different senses to be combined. This might mean that words have a particular taste (for example, the word "door" might taste like bacon), or that certain smells produce a particular colour. It might also mean that each letter and number has its own personality-the letter A might be perky, the letter B might be shy and self-conscious, etc. Some synaesthetes might even experience other people's sensations, for example feeling pain in their chest when they witness a film character gets shot. The possibilities are

endless: even though synaesthesia is believed to affect less than 5% of the general population, at least 60 different combinations of senses have been reported so far. What all these sensory associations have in common is that they are all involuntary and impossible to repress and that they usually remain quite stable over time.

C. Synaesthesia was first documented in the early 19th century by German physician Georg Sachs, who dedicated two pages of his dissertation on his own experience with the condition. It wasn't, however, until the mid-1990s that empirical research proved its existence when Professor Simon Baron-Cohen and his colleagues used fMRIs on six synaesthetes and discovered that the parts of the brain associated with vision were active during auditory stimulation, even though the subjects were blindfolded.

D. What makes synaesthesia a particularly interesting condition is that it isn't an illness at all. If anything, synaesthetes often report feeling sorry for the rest of the population, as they don't have the opportunity to experience the world in a multisensory fashion like they do. Very few drawbacks have been described, usually minimal: for instance, some words might have an unpleasant taste (imagine the word "hello" tasting like spoilt milk), while some synaesthetes find it distressing when they encounter people with names which don't reflect their personality (imagine meeting a very interesting person named "Lee", when the letter E has a dull or hideous colour for you-or vice versa). Overall, however, synaesthesia is widely considered more of a blessing than a curse and it is often linked to intelligence and creativity, with celebrities such as Lady Gaga and Pharrell Williams claiming to have it.

E. Another fascinating side of synaesthesia is the way it could potentially benefit future generations. In a 2013 study, Dr Witthof and Dr Winawer discovered that grapheme-colour synaesthetes who had never met each other before experienced strikingly similar

pairings between graphemes and colours-pairings which were later traced back to a popular set of Fischer-Price magnets that ten out of eleven participants distinctly remembered possessing as children. This was particularly peculiar as synaesthesia is predominantly considered to be a hereditary condition, and the findings suggested that a synaesthete's environment might play a determining role in establishing synaesthetic associations. If that was true, researchers asked, then might it not be possible that synaesthesia can actually be taught?

F. As it turns out, the benefits of teaching synaesthesia would be tremendous. According to research conducted by Dr Clare Jonas at the University of East London, teaching people to create grapheme-colour associations the same way as a synaesthete may have the possibility to improve cognitive function and memory. As she put it, 'one possibility is guarding against cognitive decline in older people-using synaesthesia in the creation of mnemonics to remember things such as shopping lists.' To that end, researchers in the Netherlands have already begun developing a web browser plug-in that will change the colours of certain letters. Rothen and his colleagues corroborate the theory: in a paper published in 2011, they suggest that synaesthesia might be more than a hereditary condition, as the non-synaesthetic subjects of their study were able to mimic synaesthetic associations long after leaving the lab.

G. There is obviously still a long way to go before we can fully understand synaesthesia and what causes it. Once we do, however, it might not be too long before we find out how to teach non-synaesthetes how to imitate its symptoms in a way that induces the same benefits 4.4% of the world's population currently enjoy.

Questions 1-7

Instructions to follow

- Which paragraph contains the following information?
- Write the correct letter, A-G, in boxes 1-7 on your answer sheet.

1. Some of the disadvantages related to synaesthesia
2. what scientists think about synaesthesia's real-life usefulness
3. a prediction for the future of synaesthesia
4. an example of how grapheme-colour synaesthesia works
5. a brief history of synaesthesia
6. some of the various different types of synaesthesia.
7. information about a study that suggests synaesthetic symptoms aren't arbitrary

Questions 8-11

Instructions to follow

- Do the following statements agree with the information given in Reading Passage 1?
- In boxes 8-11 on your answer sheet, write

- **TRUE** if the statement is true according to the passage
- **FALSE** if the statement is false according to the passage
- **NOT GIVEN** if the information is not given in the passage

8. There are 60 different types of synaesthesia.
9. Before Professor Simon Baron-Cohen's research, synaesthesia was thought to be a myth.
10. A lot of celebrities are affected by synaesthesia.

11 Most scientists believe that synaesthesia runs in families.

Questions 12-13

Instructions to follow

- Complete the summary.
- Choose ONE WORD ONLY from the passage for each answer.
- Write your answers in boxes 12-14 on your answer sheet.

Synaesthesia is a unique neurological condition that causes different senses to get mixed.

Recent research has suggested that teaching synaesthesia to non-synaesthetes can enhance 12..... and guard against the deterioration of cognitive 13.....

Section 2

Instructions to follow

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

The History of pencil

A. The beginning of the story of pencils started with a lightning. Graphite, the main material for producing pencil, was discovered in 1564 in Boirowdale in England when a lightning struck a local tree during a thunder. Local people found out that the black substance spotted at the root of the unlucky tree was different from burning ash of wood. It was soft, thus left marks everywhere. Chemistry was barely out of its infancy at the time, so people mistook it for lead, equally black but much heavier. It was soon put to use by locals in marking their sheep for signs of ownership and calculation.

B. Britain turns out to be the major country where mines of graphite can be detected and developed. Even so, the first pencil was invented elsewhere. As graphite is soft, it requires some form of encasement. In Italy, graphite sticks were initially wrapped in string or sheepskin for stability, becoming perhaps the very first pencil in the world. Then around 1560, an Italian couple made what are likely the first blueprints for the modem, wood-encased carpentry pencil. Their version was a flat, oval, more compact type of pencil. Their concept involved the hollowing out of a stick of juniper wood. Shortly thereafter in 1662, a superior technique was discovered by German people: two wooden halves were carved, a graphite stick inserted, and the halves then glued together – essentially the same method in use to this day. The news of usefulness of these early pencils spread far and wide, attracting the attention of artists all over the known world.

C. Although graphite core in pencils is still referred to as lead, modem pencils do not contain lead as the “lead “of the’ pencil is actually a mix of finely ground graphite and clay powders. This mixture is important because the amount of clay content added to the graphite depends on intended pencil hardness, and the amount of time spent on grinding the mixture determines the quality of the lead. The more clay you put in, the higher hardness the core has. Many pencils across the world, and almost all in Europe, are graded on the European system. This system of naming used B for black and H for hard; a pencil’s grade was described by a sequence or successive Hs or Bs such as BB and BBB for successively softer leads, and HH and HHH for successively harder ones. Then the standard writing pencil is graded HB.

D. In England, pencils continued to be made from whole sawn graphite. But with the mass production of pencils, they are getting drastically more popular in many countries with each passing decade. As demands rise, appetite for graphite soars. According to the United States Geological Survey (USGS), world production of natural graphite in 2012 was 1,100,000 tonnes, of which the following major exporters are: China, India, Brazil, North Korea and Canada. When the value of graphite was realised, the mines were taken over by the government and guarded. One of its chief uses during the reign of Elizabeth I in the second half of the 16th century was as moulds for the manufacture of camion balls. Graphite was transported from Keswick to London in armed stagecoaches. In 1751 an Act of Parliament was passed making it an offence to steal or receive “wad”. This crime was punishable by hard labour or transportation.

E. That the United States did not use pencils in the outer space till they spent $1000 to make a pencil to use in zero gravity conditions is in fact a fiction. It is widely known that astronauts in Russia used grease pencils, which don’t have breakage problems. But it is

also a fact that their counterparts in the United States used pencils in the outer space before real zero gravity pencil was invented .They preferred mechanical pencils, which produced fine lines, much clearer than the smudgy lines left by the grease pencils that Russians favoured. But the lead tips of these mechanical pencils broke often. That bit of graphite floating around the space capsule could get into someone's eye, or even find its way into machinery or electronics short or other problems. But despite the fact that the Americans did invent zero gravity pencil later, they stuck to mechanical pencils for many years.

F. Against the backcloth of a digitalized world, the prospect of pencils seems bleak. In reality, it does not. The application of pencils has by now become so widespread that they can be seen everywhere, such as classrooms, meeting rooms and art rooms, etc. A spectrum of users are likely to continue to use it into the future: students to do math works, artists to draw on sketch pads, waiters or waitresses to mark on order boards, make-up professionals to apply to faces, and architects to produce blue prints. The possibilities seem limitless.

Questions 14-19

Instructions to follow

- Complete the sentences below.
- Choose ONE WORD ONLY from the passage for each answer.
- Write your answers in boxes 14-19 on your answer sheet

Graphite was found under a 14 _____ in Borrowdale
Ancient people used graphite to sign possession and number of 15 _____ .
The first pencil was graphite wrapped in 16 _____ or animal skin.
In the eighteenth century, the 17 _____ protect the mines when the value of

graphite was realized.
During the reign of Elizabeth I, people was condemnable if they 18_____ or receive the "wad".
Russian astronauts preferred 19_____ pencils to write in the outer space.

Questions 20-26

Instructions to follow

- Do the following statements agree with the information given in Rending Passage 2?
- In boxes 20-26 on your answer sheet write

- **TRUE** if the statement agrees with the information
- **FALSE** if the statement contradicts the information
- **NOT GIVEN** if there is no information on this

20 Italy is probably the first country of the whole world to make pencils.

21 Germany used various kinds of wood to make pencils.

22 Graphite makes a pencil harder and sharper.

23 Pencils are not produced any more since the reign of Elizabeth

24 Pencil was used during the first American space expedition.

25 American astronauts did not replace mechanical pencils immediately after the zero gravity pencils were invented.

26 Pencils are unlikely to be used in the future.

Section 3

Instructions to follow

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

Stealth Forces in Weight Loss

The field of weight loss is like the ancient fable about the blind men and the elephant. Each man investigates a different part of the animal and reports back, only to discover their findings are bafflingly incompatible.

A. The various findings by public-health experts, physicians, psychologists, geneticists, molecular biologists, and nutritionists are about as similar as an elephant's tusk is to its tail. Some say obesity is largely predetermined by our genes and biology; others attribute it to an overabundance of fries, soda, and screen-sucking; still others think we're fat because of viral infection, insulin, or the metabolic conditions we encountered in the womb. "Everyone subscribes to their own little theory," says Robert Berkowitz, medical director of the Center for Weight and Eating Disorders at the University of Pennsylvania School of Medicine. We're programmed to hang onto the fat we have, and some people are predisposed to create and carry more fat than others. Diet and exercise help, but in the end the solution will inevitably be more complicated than pushing away the plate and going for a walk. "It's not as simple as 'You're fat because you're lazy' says Nikhil Dhurandhar, an associate professor at Pennington Biomedical Research Center in Baton Rouge. "Willpower is not a prerogative of thin people. It's distributed equally."

B. Science may still be years away from giving us a miracle formula for fat-loss. Hormone leptin is a crucial player in the brain's weight-management circuitry. Some people produce too little leptin; others become desensitised to it. And when obese people lose weight, their leptin levels plummet along with their metabolism. The body becomes more efficient at using fuel and conserving fat, which makes it tough to keep the weight off. Obese dieters' bodies go into a state of chronic hunger, a feeling Rudolph Leibel, an obesity researcher at Columbia University, compares to thirst. "Some people might be able to tolerate chronic thirst, but the majority couldn't stand it", says Leibel. "Is that a behavioural problem – a lack of willpower? I don't think so."

C. The government has long espoused moderate daily exercise – of the evening-walk or take-the-stairs variety – but that may not do much to budge the needle on the scale. A 150-pound person burns only 150 calories on a half-hour walk, the equivalent of two apples. It's good for the heart, less so for the gut. "Radical changes are necessary," says Deirdre Barrett, a psychologist at Havard Medical School and author of *Waistland*. "People don't lose weight by choosing the small fries or talking a little walk every other day." Barrett suggests taking a cue from the members of the Nation Weight Control Registry (NWCR), a self-selected group of more than 5,000 successful weight-losers who have shed diets an average 66 pounds and kept it off 5.5 years. Some registry members lost weight using low-carb diets; some went low-fat; other eliminated refined foods. Some did it on their own; others relied on counselling. That said, not everyone can lose 66 pounds and not everyone needs to. The goal shouldn't be getting thin, but getting healthy. It's enough to whittle your weight down to the low end of your set range, says Jeffrey Friedman, a geneticist at Rockefeller University. Losing even 10 pounds vastly decreases your risk of diabetes, heart disease, and high blood pressure. The point is to not give up just because you don't look like a swimsuit model.

D. The negotiation between your genes and the environment begins on day one. Your optimal weight, writ by genes, appears to get edited early on by conditions even before birth, inside the womb. If a woman has high blood-sugar levels while she's pregnant, her children arc more likely to be overweight or obese, according to a study of almost 10,000 mother-child pairs. Maternal diabetes may influence a child's obesity risk through a process called metabolic imprinting, says Teresa Hillier, an endocrinologist with Kaiser Permanente's Center for Health Research and the study's lead author. The implication is clear: Weight may be established very early on, and obesity largely passed from mother to child. Numerous studies in both animals and humans have shown that a mother's obesity directly increases her child's risk for weight gain. The best advice for moms-to-be: Get fit before you get pregnant. You'll reduce your risk of complications during pregnancy and increase your chances of having a normal-weight child.

E. It's the $64,000 question: Which diets work? It got people wondering: Isn't there a better way to diet? A study seemed to offer an answer. The paper compared two groups of adults: those who, after eating, secreted high levels of insulin, a hormone that sweeps blood sugar out of the bloodstream and promotes its storage as fat, and those who secreted less. Within each group, half were put on a low-fat diet and half on a low-glycemic-load diet. On average, the low-insulin-secreting group fared the same on both diets, losing nearly 10 pounds in the first six months — but they gained about half of it back by the end of the 18-month study. The high-insulin group didn't do as well on the low-fat plan, losing about 4.5 pounds, and gaining back more than half by the end. But the most successful were the high-insulin-secretors on the low-glycemic-load diet. They lost nearly 13 pounds and kept it off.

F. What if your fat is caused not by diet or genes, but by germs — say, a virus? It sounds like

a sci-fi horror movie, but research suggests some dimension of the obesity epidemic may be attributable to infection by common viruses, says Dhurandhar. The idea of "infectobesity" came to him 20 years ago when he was a young doctor treating obesity in Bombay. He discovered that a local avian virus, SMAM-1, caused chickens to die, sickened with organ damage but also, strangely, with lots of abdominal fat. In experiments, Dhurandhar found that SMAM-1 -infected chickens became obese on the same diet as uninfected ones, which stayed svelte.

G. He later moved to the U.S. and onto a bona fide human virus, adenovirus 36 (AD-36). In the lab, every species of animal Dhurandhar infected with the virus became obese — chickens got fat, mice got fat, even rhesus monkeys at the zoo that picked up the virus from the environment suddenly gained 15 percent of their body weight upon exposure. In his latest studies, Dhurandhar has isolated a gene that, when blocked from expressing itself, seems to turn off the virus's fattening power. Stem cells extracted from fat cells and then exposed to AD-36 reliably blossom into fat cells — but when stem cells are exposed to an AD-36 virus with the key gene inhibited, the stems cells don't differentiate. The gene appears to be necessary and sufficient to trigger AD-36-related obesity, and the goal is to use the research to create a sort of obesity vaccine.

Questions 27-31

Instructions to follow

- Reading Passage 3 has seven paragraphs, A-G.
- Which paragraph contains the following information?
- Write the Correct letter, A-G, in boxes 27-31 on your answer sheet.
- **NB** You may use any letter more than once

27 evaluation on the effect of weight loss on different kinds of diets

28 an example of a research which includes the relatives of the participants

29 an example of a group of people who did not regain weight immediately after weight loss

30 long-term hunger may appear to be acceptable to some of the participants during the period of losing weight program

31 a continuous experiment may lead to a practical application besides diet or hereditary resort

Questions 32-36

Instructions to follow

- Look at the following findings (Question 32-36) and the list of researchers below.
- Match each finding with the correct researcher, A-F
- Write the correct letter, A-F, in boxes 32-36 on your answer sheet.
- NB You may use any letter more than once

32 A person's weight is determined by the interaction of his/her DNA and the environment.

A ○ B ○ C ○ D ○ E ○ F ○

33 Pregnant mothers who are overweight may risk their fetus in gaining weight.

A ○ B ○ C ○ D ○ E ○ F ○

34 The aim of losing weight should be keeping healthy rather than being attractive.

A ○ B ○ C ○ D ○ E ○ F ○

35 Small changes in lifestyle will not help in reducing much weight.

A ○ B ○ C ○ D ○ E ○ F ○

36 Researchers can be divided into different groups with their own point of view about weight loss.

A ○ B ○ C ○ D ○ E ○ F ○

List of Researchers

A Robert Berkowitz.

B Rudolph Leibel.

C Nikhil Dhurandhar.

D Deirdre Barret.

E Jeffrey Friedman.

F Teresa Hillier.

Questions 37-40

Instructions to follow

- Complete the sentences below
- Choose ONE WORD AND/OR A NUMBER from the passage for each answer.
- Write your answers in boxes 37-40 on your answer sheet.

In Bombay Clinic, a young doctor who came up with the concept 'infectobesity' believed that the obesity is caused by a kind of virus. For years, he conducted experiments on 37_____ . Finally, later as he moved to America, he identified a new virus named 38_____ which proved to be a significant breakthrough in inducing more weight. Although there seems no way to eliminate the virus till now, a kind of 39_____ can be separated as to block the effectiveness of the

virus. In the future, the doctor is aiming at developing a new 40 _____ which might effectively combat against the virus.