IELTSFever Academic Reading Test 85

Reading Passage 1

The success of cellulose

You should spend about 20 minutes on Questions 1-13 which are based on the Reading Passage below.

{A} Not too long ago many investors made the bet that renewable fuels from bio- mass would be the next big thing in energy. Converting corn, sugarcane and soybeans into ethanol or diesel-type fuels lessens our nation's dependence on oil imports while cutting carbon dioxide emissions. But already the nascent industry faces challenges. Escalating demand is hiking food prices while farmers clear rain-forest habitats to grow fuel crops. And several recent studies say that certain biofuel-production processes either fail to yield net energy gains or release more carbon dioxide than they use.

{B} A successor tier of start-up ventures aims to avoid those problems. Rather than focusing on the starches, sugars and fats of food crops, many of the prototype bioethanol processes work with lignocellulose, the "woody" tissue that strengthens the cell walls of plants, says University of Massachusetts Amherst chemical engineer George W. Huber. Although the cellulose breaks down less easily than sugars and starches and thus requires a complex series of enzyme-driven chemical reactions, its use opens the industry to nonfood plant feed- stocks such as agricultural wastes, wood chips and switchgrass. But no company has yet demonstrated a cost-competitive industrial process for making cellulosic biofuels.

{C} So scientists and engineers are working on dozens of possible biofuel-processing routes, reports Charles Wyman, a chemical engineer at the University of California, Riverside, who is a founder of Mascoma Corporation in Cambridge, Mass., a leading developer of cellulosic ethanol processing." There's no miracle process out there," he remarks. And fine-tuning a process involves considerable money and time. “The oil companies say that it takes 10 years to fully commercialize an industrial processing route," warns Huber, who has contributed some thermochemical techniques to another biomass start-up, Virent Energy Systems in Madison, Wis.

{D} One promising biofuel procedure that avoids the complex enzymatic chemistry to break down cellulose is now being explored by Coskata in Warrenville, Ill., a firm launched in 2006 by high-profile investors and entrepreneurs (General Motors recently took a minority stake in it as well). In the Coskata operation, a conventional gasification system will use heat to turn various feedstocks into a mixture of carbon monoxide and hydrogen called syngas, says Richard Tobey, vice president of Engineering and R&D. The ability to handle multiple plant feedstocks would boost the flexibility of the overall process because each region in the country has access to certain feedstocks but not others.

{E} Instead of using thermochemical methods to convert the syngas to fuel- a process that can be significantly more costly because of the added expense of pressurizing gases, according to Tobey - the Coskata group chose a biochemical route. The group focused on five promising strains of ethanol-excreting bacteria that Ralph Tanner, a microbiologist at the University of Oklahoma, had discovered years before in the oxygen-free sediments of a swamp. These anaerobic bugs make ethanol by voraciously consuming syngas.

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{F} The “heart and soul of the Coskata process," as Tobey puts it, is the bioreactor in which the bacteria live. “Rather than searching for food in the fermentation mash in a large tank, our bacteria wait for the gas to be delivered to them," he explains. The firm relies on plastic tubes, the filter-fabric straws as thin as human hair. The syngas flows through the straws, and water is pumped across their exteriors. The gases diffuse across the selective membrane to the bacteria embedded in the outer surface of the tubes, which permits no water inside. “We get efficient mass transfer with the tubes, which is not easy," Tobey says. "Our data suggest that in an optimal setting we could get 90 percent of the energy value of the gases into our fuel." After the bugs eat the gases, they release ethanol into the surrounding water. Standard distillation or filtration techniques could extract the alcohol from the water.

{G} Coskata researchers estimate that their commercialized process could deliver ethanol at under $1 per gallon-less than half of today's $2-per-gallon wholesale price, Tobey claims. Outside evaluators a Argonne National Laboratory measured the input-output "energy balance" of the Coskata process and found that, optimally, it can produce 7.7 times as much energy in the end product as it takes to make it.

{H} The company plans to construct a 40,000-gallon-a-year pilot plant near the GM test track in Milford, Mich., by the end of this year and hopes to build a full-scale, 100-million-gallon-a-year plant by 2011. Coskata may have some company by then; Bioengineering Resources in Fayetteville, Ark., is already developing what seems to be a similar three-step pathway in which syngas is consumed by bacteria isolated by James Gaddy, a retired chemical engineer at the University of Arkansas. Considering the advances in these and other methods, plant cellulose could provide the greener ethanol everyone wants.

Questions 1-6

Use the information in the passage to match the people (listed A-D) with opinions or deeds below. Write the appropriate letters A-D in boxes 1-6 on your answer sheet. ***NB you may use any letter more than once***

(A) George W. Huber

(B) James Gaddy

(C) Richard Tobey

(D) Charles Wyman

(1) A key component to gain success lies in the place where the organisms survive.

(2) Engaged in separating fixed procedures to produce ethanol in homologous biochemical way.

(3) Assists to develop certain skills.

(4) It needs arduous efforts to achieve highly efficient transfer.

(5) There is no shortcut to expedite the production process.

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(6) A combination of chemistry and biology can considerably lower the cost needed for the production company.

Questions 7-10

Do the following statements agree with the information given in Reading Passage 1? In boxes 7-10 on your answer sheet, write

TRUE	if the statement is True
FALSE	if the statement is false
NOT GIVEN	If the information is not given in the passage

(7) A shift from conventionally targeted areas of the vegetation to get ethanol takes place.

(8) It takes a considerably long way before a completely mature process is reached.

(9) The Coskata group sees no bright future for the cost advantage available in the production of greener ethanol.

(10) Some enterprises are trying to buy the shares of Coskata group.

Questions 11-13

Summary

Complete the following summary of the paragraphs of Reading Passage,
*using **No More than Three words** from the Reading Passage for each answer.*
Write your answers in boxes 11-13 on your answer sheet.

Tobey has noticed that the Coskata process can achieve a huge success because it utilises ..... **11**.....as the bioreactor on whose exterior surface the bacteria take the syngas going through the coated .....**12**..... To produce the ethanol into the water outside which researchers will later .....**13**..... by certain techniques. The

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figures show a pretty high percentage of energy can be transferred into the fuel which is actually very difficult to achieve.

Reading Passage 2

What Does the Consumer Think ?

{A} MARKETING people are no longer prepared to take your word for it that you favour one product over another. They want to scan your brain to see which one you really prefer. Using the tools of neuroscientists, such as electroencephalogram (EEG) mapping and functional magnetic-resonance imaging (fMRI), they are trying to learn more about the mental processes behind purchasing decisions. The resulting fusion of neuroscience and marketing is, inevitably, being called 'neuromarketing'.

{B} The first person to apply brain-imaging technology in this way was Gerry Zaltman of Harvard University, in the late 1990s. The idea remained in obscurity until 2001, when BrightHouse, a marketing consultancy based in Atlanta, Georgia, set up a dedicated neuromarketing arm, BrightHouse Neurostrategies Group. (BrightHouse lists Coca-Cola, Delta Airlines and Home Depot among its clients.) But the company's name may itself simply be an example of clever marketing. BrightHouse does not scan people while showing them specific products or campaign ideas, but bases its work on the results of more general fMRI-based research into consumer preferences and decision-making carried out at Emory University in Atlanta.

{C} Can brain scanning really be applied to marketing? The basic principle is not that different from focus groups and other traditional forms of market research. A volunteer lies in an fMRI machine and is shown images or video clips. In place of an interview or questionnaire, the subject's response is evaluated by monitoring brain activity. fMRI provides real-time images of brain activity, in which different areas 'light up' depending on the level of blood flow. This provides clues to the subject's subconscious thought patterns. Neuroscientists know, for example, that the sense of self is associated with an area of the brain known as the medial prefrontal cortex. A flow of blood to that area while the subject is looking at a particular logo suggests that he or she identifies with that brand.

{D} At first, it seemed that only companies in Europe were prepared to admit that they used neuromarketing. Two carmakers, DaimlerChrysler in Germany and Ford's European arm, ran pilot studies in 2003. But more recently, American companies have become more open about their use of neuromarketing. Lieberman Research Worldwide, a marketing firm based in Los Angeles, is collaborating with the California Institute of Technology (Caltech) to enable movie studios to market- test film trailers. More controversially, the New York Times recently reported that a political consultancy, FKF Research, has been studying the effectiveness of campaign commercials using neuromarketing techniques.

{E} Whether all this is any more than a modern-day version of phrenology, the Victorian obsession with linking lumps and bumps in the skull to personality traits, is unclear. There have been no large-scale studies, so scans of a handful of subjects may not be a reliable guide to consumer behaviour in general. Of course, focus groups and surveys are flawed too: strong personalities can steer the outcomes of focus groups, and some people may be untruthful in

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their responses to opinion pollsters. And even honest people cannot always explain their preferences.

{F} That is perhaps where neuromarketing has the most potential. When asked about cola drinks, most people claim to have a favourite brand, but cannot say why they prefer that brand's taste. An unpublished study of attitudes towards two well- known cola drinks, Brand A and Brand B, carried out last year in a college of medicine in the US found that most subjects preferred Brand B in a blind testing – fMRI scanning showed that drinking Brand B lit up a region called the ventral putamen, which is one of the brain's 'reward centres, , far more brightly than Brand A. But when told which drink was which, most subjects said they preferred Brand A, which suggests that its stronger brand outweighs the more pleasant taste of the other drink.

{G} 'People form many unconscious attitudes that are obviously beyond traditional methods that utilise introspection,, says Steven Quartz, a neuroscientist at Caltech who is collaborating with Lieberman Research. With over 100 billion dollars spent each year on marketing in America alone, any firm that can more accurately analyse how customers respond to brands could make a fortune.

{H} Consumer advocates are wary. Gary Ruskin of Commercial Alert, a lobby group, thinks existing marketing techniques are powerful enough. "Already, marketing is deeply implicated in many serious pathologies", he says. "That is especially true of children, who are suffering from an epidemic of marketing-related diseases, including obesity and type-2 diabetes. Neuromarketing is a tool to amplify these trends.' Dr. Quartz counters that neuromarketing techniques could equally be used for benign purposes. 'There are ways to utilise these technologies to create more responsible advertising, , he says. Brain- scanning could, for example, be used to determine when people are capable of making free choices, to ensure that advertising falls within those bounds.

{**I}** Another worry is that brain-scanning is an invasion of privacy and that information on the preferences of specific individuals will be misused. But neuromarketing studies rely on small numbers of volunteer subjects, so that seems implausible. Critics also object to the use of medical equipment for frivolous rather than medical purposes. But as Tim Ambler, a neuromarketing researcher at the London Business School, says, 'A tool is a tool, and if the owner of the tool gets a decent rent for hiring it out, then that subsidises the cost of the equipment, and everybody wins.' Perhaps more brain-scanning will someday explain why some people like the idea of neuromarketing, but others do not.

Questions 14-19

Reading Passage 2 has ten paragraphs A-J.

Choose the correct heading for Paragraphs B-G from the list of headings below. Write the correct number (i-x) in boxes 14-19 on your answer sheet.

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List of Heading

(i) A description of the procedure and mechanism

(ii) An international research project

(iii) An experiment to investigate consumer responses

(Iv) Marketing with an alternative name

(V) A misleading name for business?

(Vi) A potentially profitable line of research

(Vii) Medical dangers of the technique

(Viii) Internal drawbacks to marketing tools

(Ix) Broadening applications

(X) What is neuromarketing?

Example

Paragraph A x

(14) Paragraph B

(15) Paragraph C

(16) Paragraph D

(17) Paragraph E

(18) Paragraph F

(19) Paragraph G

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Questions 20-22

Look at the following people (Questions 20-22) and the list of opinions below. Match each person with the opinion credited to him.

Write the correct letter A-F in boxes 20-22 on your answer sheet.

(20) Steven Quartz

(21) Gary Ruskin

(22) Tim Ambler

List of opinions

(A) Neuromarketing could be used to contribute towards the cost of medical technology

(B) Neuromarketing could use introspection as a tool in marketing research.

(C) Neuromarketing could be a means of treating medical problems.

(D) Neuromarketing could make an existing problem worse.

(E) Neuromarketing could lead to the misuse of medical equipment.

(F) Neuromarketing could be used to prevent the exploitation of consumers

Questions 23-26

Complete the summary below using words from the passage.
*Choose **ONE WORD ONLY** from the passage for each answer.*
Write your answers in boxes 23-26 on your answer sheet.

Neuromarketing can provide valuable information on attitudes to particular **23.**..... It may be more reliable than surveys, where people can be **24** ……..., or focus groups, where they may be influenced by others. It also allows researchers to identify the subject's **25**.....thought patterns. However, some people are concerned that it could lead to problems such as an increase in disease among **26** …….

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Reading Passage 3

Music: Language We All Speak

Section A: Music is one of the human specie's relatively few universal abilities. Without formal training, any individual, from Stone Age tribesman to suburban teenager has the ability to recognize music and, in some fashion, to make it. Why this should be so is a mystery. After all, music isn't necessary for getting through the day, and if it aids in reproduction, it does so only in highly indirect ways. Language, by contrast, is also everywhere- but for reasons that are more obvious. With language, you and the members of your tribe can organize a migration across Africa, build reed boats and cross the seas, and communicate at night even when you can't see each other. Modern culture, in all its technological extravagance, springs directly from the human talent for manipulating symbols and syntax. Scientists have always been intrigued by the connection between music and language. Yet over the years, words and melody have acquired a vastly different status in the lab and the seminar room. While language has long been considered essential to unlocking the mechanisms of human intelligence, music is generally treated as an evolutionary frippery - mere "auditory cheesecake," as the Harvard cognitive scientist Steven Pinker puts it.

Section B: But thanks to a decade-long wave of neuroscience research, that tune is changing. A flurry of recent publications suggests that language and music may equally be able to tell us who we are and where we're from - not just emotionally, but biologically. In July, the journal Nature Neuroscience devoted a special issue to the topic. And in an article in the August 6 issue of the Journal of Neuroscience, David Schwartz, Catherine Howe, and Dale Purves of Duke University argued that the sounds of music and the sounds of language are intricately connected.

To grasp the originality of this idea, it's necessary to realize two things about how music has traditionally been understood. First, musicologists have long emphasized that while each culture stamps a special identity onto its music; music itself has some universal qualities. For example, in virtually all cultures sound is divided into some or all of the 12 intervals that make up the chromatic scale - that is, the scale represented by the keys on a piano. For centuries, observers have attributed this preference for certain combinations of tones to the mathematical properties of sound itself. Some 2,500 years ago, Pythagoras was the first to note a direct relationship between the harmoniousness of a tone combination and the physical dimensions of the object that produced it. For example, a plucked string will always play an octave lower than a similar string half its size, and a fifth lower than a similar string two-thirds its length. This link between simple ratios and harmony has influenced music theory ever since.

Section C: This music-is-moth idea is often accompanied by the notion that music formally speaking at least, exists apart from the world in which it was created. Writing recently in The New York Review of Books, pianist and critic Charles Rosen discussed the long-standing notion

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that while painting and sculpture reproduce at least some aspects of the natural world, and writing describes thoughts and feelings we are all familiar with, music is entirely abstracted from the world in which we live. Neither idea is right, according to David Schwartz and his colleagues. Human musical preferences are fundamentally shaped not by elegant algorithms or ratios but by the messy sounds of real life, and of speech in particular -which in turn is shaped by our evolutionary heritage." The explanation of music, like the explanation of any product of the mind, must be rooted in biology, not in numbers per se," says Schwartz.

Schwartz, Howe, and Purves analyzed a vast selection of speech sounds from a variety of languages to reveal the underlying patterns common to all utterances. In order to focus only on the raw sound, they discarded all theories about speech and meaning and sliced sentences into random bites. Using a database of over 100,000 brief segments of speech, they noted which frequency had the greatest emphasis in each sound. The resulting set of frequencies, they discovered, corresponded closely to the chromatic scale. In short, the building blocks of music are to be found in speech

Far from being abstract, music presents a strange analog to the patterns created by the sounds of speech. "Music, like the visual arts, is rooted in our experience of the natural world," says Schwartz. " It emulates our sound environment in the way that visual arts emulate the visual environment." In music we hear the echo of our basic sound-making instrument- the vocal tract. The explanation for human music is simple; still than Pythagoras's mathematical equations. We like the sounds that are familiar to us specifically, we like sounds that remind us of us.

This brings up some chicken-or-egg evolutionary questions. It may be that music imitates speech directly, the researchers say, in which case it would seem that language evolved first. It's also conceivable that music came first and language is in effect an Imitation of song - that in everyday speech we hit the musical notes we especially like. Alternatively, it may be that music imitates the general products of the human sound-making system, which just happens to be mostly speech. "We can't know this," says Schwartz. "What we do know is that they both come from the same system, and it is this that shapes our preferences."

Section D: Schwartz's study also casts light on the long-running question of whether animals understand or appreciate music. Despite the apparent abundance of "music" in the natural world- birdsong, whalesong, wolf howls, synchronized chimpanzee hooting previous studies have found that many laboratory animals don't show a great affinity for the human variety of music making. Marc Hauser and Josh McDermott of Harvard argued in the July issue of Nature Neuroscience that animals don't create or perceive music the way we do. The act that laboratory monkeys can show recognition of human tunes is evidence, they say, of shared general features of the auditory system, not any specific chimpanzee musical ability. As for birds, those most musical beasts, they generally recognize their own tunes - a narrow repertoire - but don't generate novel melodies like we do. There are no avian Mozarts.

But what's been played to the animals, Schwartz notes, is human music. If animals evolve preferences for sound as we do - based upon the soundscape in which they live - then their "music" would be fundamentally different from ours. In the same way our scales derive from human utterances, a cat's idea of a good tune would derive from yowls and meows. To demonstrate that animals don't appreciate sounds the way we do, we'd need evidence that they don't respond to "music" constructed from their own sound environment.

Section E: No matter how the connection between language and music is parsed, what is apparent is that our sense of music, even our love for it, is as deeply rooted in our biology and in

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our brains as language is. This is most obvious with babies, says Sandra Trehub at the University of Toronto, who also published a paper in the Nature Neuroscience special issue.

For babies, music and speech are on a continuum. Mothers use musical speech to "regulate infants' emotional states." Trehub says. Regardless of what language they speak, the voice all mothers use with babies is the same: "something between speech and song." This kind of communication "puts the baby in a trance-like state, which may proceed to sleep or extended periods of rapture." So if the babies of the world could understand the latest research on language and music, they probably wouldn't be very surprised. The upshot, says Trehub, is that music may be even more of a necessity than we realize.

Questions 27-31

Reading Passage 3 has five sections A-E.

Choose the correct heading for each section from the list of headings below.

Write the correct number i-viii in boxes 27-31 on your answer sheet.

List of Headings

(i) Animals sometimes make music.

(ii) Recent research on music

(iii) Culture embedded in music

(iv) Historical theories review

(V) Communication in music with animals

(vi) Contrast between music and language

(vii) Questions on a biological link with human and music

(viii) Music is good for babies.

(27) Section A

(28) Section B

(29) Section C

(30) Section D

(31) Section E

Questions 32-38

Look at the following people and list of statements below.

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Match each person with the correct statement.

Write the correct letter A-G in boxes 32-38 on your answer sheet.

List of Statements

(A) Music exists outside of the world in which it is created.

(B) Music has a common feature though cultural influences affect

(C) Humans need music.

(D) Music priority connects to the disordered sound around.

(E) Discovery of mathematical musical foundation.

(F) Music is not treated equally well compared with language

(G) Humans and monkeys have similar traits in perceiving sound.

(32) Steven Pinker

(33) Musicologists

(34) Greek philosopher Pythagoras

(35) Schwartz, Howe, and Purves

(36) Marc Hauser and Josh McDermott

(37) Charles Rosen

(38) Sandra Trehub

Questions 39-40

Choose the correct letter A, B, C or D Write your answers in boxes 39-40 on your answer sheet.

Question 39 Why was the study of animal's music uncertain?

(A) Animals don't have the same auditory system as humans.

(B) Experiments on animal's music are limited.

(C) tunes are impossible for animals to make up.

(D) Animals don't have spontaneous ability for the tests.

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Question 40 What is the main subject of this passage?

(A) Language and psychology.

(B) Music formation.

(C) Role of music in human society.

(D) Music experiments for animals.

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