1 Read the passage below and then answer the questions [1] - [11] about it. Choose the most appropriate answers based on what is stated in the passage.

Japanese firms do a number of things extremely well. One is to train their people carefully, a strategy that many successful Western firms also **<1>** employ. Another is to try to remain technologically advanced. A third, increasingly important because of its uniqueness to the Japanese, is to keep a **<2>** keen focus on developing and bringing to market goods that are competitively priced.

In [3] Western firms, many Japanese companies use a "target cost" approach. Like other multinational firms, Japanese companies begin the new product development process by conducting marketing research and examining the characteristics of the product to be produced. At this point, however, the Japanese take a different approach. The traditional approach used around the world is next to go into designing, engineering, and supplier pricing and then to determine if the cost is sufficiently competitive to move ahead with manufacturing. Japanese manufacturers, in contrast, first determine the price that the consumer most likely will accept, and then they work with design, engineering, and supply people to ensure that the product can be produced at this price. The other major difference is that after most firms **<3>** manufacture a product, they will engage in periodic cost reductions. The Japanese, however, use an approach called the "*kaizen approach*", which promotes [4] cost reduction efforts.

Additionally, Japanese companies look at profit in terms of product lines rather than just individual goods. Therefore, a consumer product that would be rejected for production by Western firms because its **<4>** estimated profitability is too low may be accepted by a Japanese firm because the product will attract additional customers to other products in the line. For example, Company A, which decided to build a smaller version of its compact personal stereo system and market it to older consumers. The company knew that the profitability of the unit would not be as high as usual, but it went ahead because the product would provide another market opportunity for the firm and strengthen its reputation. Also, a side benefit is that once a product is out there, it may appeal to an unanticipated market. This was the case with Company A's compact personal stereo system. The unit caught on with young people, and the company's sales were 50 percent greater than anticipated. Had Company A based its manufacturing decision solely on "stand-alone" profitability, the unit never would have been produced.

These approaches are not unique to Japanese firms. Foreign companies operating in Japan are catching on and using **<5>** them as well. Company B is the leading foreign company in the Japanese soft drink market, which sees the introduction of more than 1,000 new products each year. Most new products do not last very long, and finance specialists may well [5] that it is not worth the effort to produce them. However, Company B introduces one new product a month. Most of these sodas, soft drinks, and cold coffees survive less than 90 days, but Company B does not let the short-term bottom line determine the decision. The firm goes beyond quick profitability and looks at the overall picture. Result: Company B continues to be the leading soft drink firm in Japan despite competition that often is more vigorous than [6] in the United States.

1. For **<1>** employ and **<2>** keen, choose ONE answer that is closest in meaning from each list.

[1]	**<1>** employ	① get a job	② work	③ make use of	④ hire	⑤ explore
[2]	**<2>** keen	① bright	② sharp	③ interested	④ cool	⑤ excited

2. For [3] - [6] in the passage, choose ONE answer from each list.

[3]	① spite of	② addition	③ the context of	④ contrast to	⑤ charge of
[4]	① continuous	② fluent	③ reluctant	④ acceptable	⑤ quite
[5]	① be	② offended	③ grab	④ engage	⑤ argue
[6]	① which	② that	③ those	④ them	⑤ it

3. In the words **<3>** manufacture and **<4>** estimated, which syllable is most stressed? Choose ONE answer for each word.

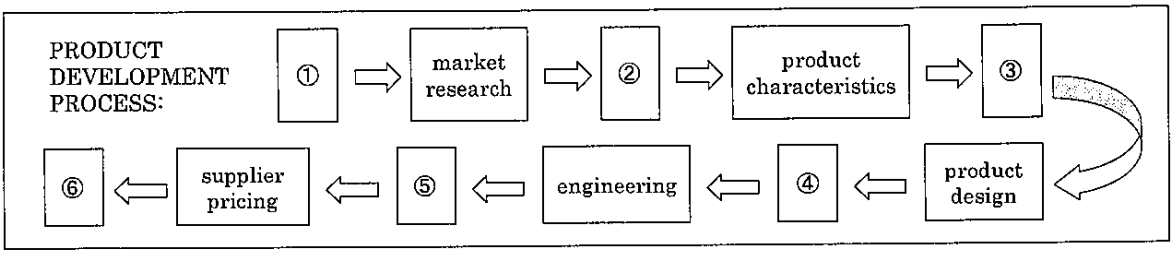
[7] **<3>** manufacture — man-u-fac-ture
① ② ③ ④

[8] **<4>** estimated — es-ti-mat-ed
① ② ③ ④

4. [9] What does **<5>** them refer to? Choose ONE answer.

① young people	② the company's sales	③ Company A	④ profitability
⑤ approaches	⑥ Japanese firms	⑦ Foreign companies	⑧ new products

5. [10] Based on the information in paragraph 2, choose ONE answer from ①-⑥ in the product development process that indicates where Japanese companies determine price.



6. [11] Which ONE of the following is NOT mentioned as a benefit for Japanese companies when looking at profit in terms of product lines rather than just individual goods?

① attract customers to other products in the line
② provide another market opportunity for the company
③ strengthen the reputation of the company
④ increase the profitability of each product in the line
⑤ appeal to an unanticipated market

2 Read the passage below and then answer the questions [12] - [20] about it. Choose the most appropriate answers based on what is stated in the passage.

Imagine you're on the freeway, and the driver in the next lane suddenly moves in front of you. You quickly brake to avoid hitting him. Your neck muscles begin to **<1> tense up**, your jaw and lips tighten, and your face frowns*. Your wife in the passenger seat immediately notices your angry expression. In contrast, remember a time when you were depressed. Your face sank, your stare lowered, and people around you noticed.

Recognizing emotions on other people's faces **<2> comes naturally** to us. This skill goes beyond the barriers of language, race, culture, national origin, and even species, as we can recognize an angry dog or a frightened cat. Nature programmed humans to recognize various emotions easily and adjust our responses accordingly. **<3> Your emotions are so apparent because your brain sends out a distinct pattern of signals to the face's many small muscles, which means that every emotion has a corresponding facial expression**. The people around you can perceive your facial expressions instantly. Each of us is an open book.

But we are [15] blind to the manifestations of these emotions. When you are getting angry in traffic, your brain sends out a characteristic pattern of signals to your digestive system, just as it does to your facial muscles; the digestive system also responds dramatically. As you experienced being angry about the driver who cut you off, your stomach went into vigorous contractions, which increased its production of acid and slowed the emptying of the scrambled eggs you ate for breakfast. Meanwhile your intestines* twisted and produced digestive juices. A similar [16] distinct pattern happens when you're anxious or upset. When you're depressed, your intestines hardly move at all. In fact, we now know that your gut mirrors every emotion that arises in your brain.

The activity of these brain circuits affects other organs as well, creating a coordinated response to every emotion you feel. When you're stressed, for example, your heartbeat speeds and your neck and shoulder muscles tighten, and the reverse happens when you're relaxed. But the brain is tied to the gut like no other organ, with far more extensive, deep-rooted connections. Because people have always felt emotion in their gut, our language is rich with expressions that reflect this. Every time your stomach was *tied up in knots* (felt anxious), you had a *gut-wrenching* (discomforting) experience, or you *felt butterflies* (had a nervous feeling) in your stomach, it was the emotion-generating circuits of your brain that were responsible. Your emotions, brain, and gut are uniquely [17].

If a patient with abnormal gut reactions seeks help from the medical system and an endoscopy* does not reveal something more serious, such as a tumor, physicians often dismiss the importance of the patient's symptoms. Frustrated about their inability to provide effective relief, they tend to recommend special diets or pills to normalize abnormal bowel habits, without addressing the true cause of the gut reaction. If more doctors and patients realized that the gut is in fact a theater in which the drama of emotion plays out, that drama might be less likely to become a painful experience for patients. Nearly 15 percent of the U.S. population suffers from a range of abnormal gut reactions, including irritable bowel syndrome, chronic constipation, and indigestion*, which all fall into the category of brain-gut disorders. They suffer from symptoms that range from mild sickness all the way to unbearable, severe pain. Amazingly, a large number of patients suffering from abnormal gut reactions [18] no idea that their gut problems reflect their emotional state.

<<NOTES*>>
frowns = to make an angry or worried facial expression by bringing your eyebrows closer together
intestines = 腸
endoscopy = 内視鏡検査
irritable bowel syndrome, chronic constipation, and indigestion = 過敏性腸症候群、慢性便秘、消化不良

1. For **<1> tense up** and **<2> comes naturally**, choose ONE answer that is closest in meaning from each list.

[12]	**<1> tense up**	① contract	② stretch out	③ heat up	④ be nervous	⑤ exhaust
[13]	**<2> comes naturally**	① takes someone for granted	② is not caused by humankind	③ is absolutely necessary	④ is done effortlessly	⑤ brings truth

2. [14] For the underlined sentence **<3> Your emotions are...**, which of the following best expresses its key information? Choose ONE answer.

① It appears that every person has a different way of reacting.
② It is difficult to respond to the emotions of other people.
③ The brain has total control of your facial muscles and emotions.
④ The brain creates a unique facial expression for each emotion.
⑤ When we experience an emotion, our eyes do not blink as often.

3. For [15] - [18] in the passage, choose ONE answer from each list.

[15]	① slowly	② correctly	③ literally	④ proudly	⑤ legally
[16]	① nor	② so	③ yet	④ more	⑤ of
[17]	① connects	② connected	③ connection	④ connections	⑤ to connect
[18]	① is	② are	③ were	④ has	⑤ have

4. [19] In what ways do emotions affect the human body? Choose TWO answers that are mentioned in the passage.

① The stomach changes the amount of acid produced.
② The intestines become hard and stop moving.
③ The heart beats faster or slower than normal.
④ Neck and shoulder muscles become painful.
⑤ The use of interesting language expressions increases.

5. [20] According to the last paragraph, what does the author imply that doctors should consider when providing treatment? Choose ONE answer.

① using special diets or pills as the first treatment option
② using non-traditional medicine to treat illnesses
③ carrying out a detailed examination using modern equipment
④ recognizing the influence that emotions can have on physical health
⑤ doing role-playing activities and analyzing the emotions that develop

3 Read the passage below and then answer the questions [21] - [31] about it. Choose the most appropriate answers based on what is stated in the passage.

The Global Human Population

The human population has grown explosively over the last four centuries. In 1650, about 500 million people lived on Earth. Our population doubled to 1 billion within the next two centuries, doubled again to 2 billion by 1930, and doubled still again to 4 billion by 1975. Notice that the time it took our population to double in size decreased from 200 years in 1650 to just 45 years in 1930. Thus, historically our population has grown even faster than rapid growth, which has a constant rate of increase and therefore, a constant doubling time.

The global population is now more than 7.2 billion people and is increasing by about 78 million each year. This [21] into more than 200,000 people each day, the equivalent of adding a city the size of Amarillo, Texas. At this rate, it takes only about four years to add the equivalent of another United States to the world population. Ecologists predict there will be 8.1–10.6 billion people on Earth by the year 2050.

Though the global population is still growing, the rate of growth began to slow during the 1960s. The annual rate of increase in the global population [22] at 2.2% in 1962 but was only 1.1% in 2014. Current models project a growth rate of 0.5% by 2050, which would add 45 million more people per year if the population climbs to a projected 9 billion. **<1>** The reduction in annual growth rate observed over the past four decades shows that the human population is now growing more slowly than expected in rapid growth. This change resulted from fundamental shifts in population movements due to diseases, including AIDS, and to voluntary population control.

Regional Patterns of Population Change

We have described changes in the global population, but population movements vary widely from region to region. In a stable regional population, birth rate equals death rate (not including the effects of immigration and emigration*). Two possible formulae for a stable population are:

Zero population growth = High birth rate − High death rate
Zero population growth = Low birth rate − Low death rate

The movement from high birth and death rates toward low birth and death rates, which tends to accompany industrialization and improved living conditions, is called the demographic transition. In Sweden, this transition took about 150 years, from 1810 to 1975, when birth rates finally approached death rates. In Mexico, where the human population is still growing rapidly, the transition is projected to take until at least 2050. Demographic transition is associated with an increase in the quality of health care and cleanliness as well as improved access to education, especially for women.

After 1950, death rates declined rapidly in most developing countries, but birth rates have declined more variably. Birth rates have fallen most dramatically in China. In 1970, the Chinese birth rate predicted an average of 5.9 children per woman per lifetime (total birth rate); by 2011, largely because of the government's strict one-child policy, the total birth rate was 1.6 children. In some countries of Africa, the transition to lower birth rates has also been rapid, though birth rates remain high in most of sub-Saharan Africa.

[23] do such variable birth rates affect the growth of the world's population? In industrialized nations, populations are close to balance, with birth rates near the replacement level of 2.1 children per female (over their life-time). In many industrialized countries, including Canada, Germany, Japan, and the United Kingdom, total birth rates are in fact below the replacement level. These populations will eventually decline if there is no immigration and < [27] >. In fact, the population is already declining in many eastern and central **<2>** European countries. Most of the current global population growth < [28] >, where about 80% of the world's people now live.

A unique feature of human population growth is our ability to control family sizes through planning and **<3>** voluntary birth control. Social change and the rising educational and career ambitions of women in many cultures encourage women to delay marriage and postpone having babies. Delaying having babies helps to decrease population growth rates and to < [29] > and low death rates. However, there is a great deal of disagreement as to how much support should be provided for global family planning efforts.

<<NOTES*>>
immigration and emigration = （入国）移住と（他国への）移住

1. For [21] - [23] in the passage, choose ONE answer from each list.

[21]	① describes	② surfaces	③ translates	④ flows	⑤ alternates
[22]	① arrived	② increased	③ climbed	④ peaked	⑤ added
[23]	① Can	② What	③ Who	④ Which	⑤ How

2. [24] For the underlined sentence <1> The reduction in..., find the MAIN VERB of the sentence. Choose ONE answer.

① reduction ② rate ③ observed ④ shows ⑤ is ⑥ expected

3. For <2> European and <3> voluntary, identify the most stressed vowel, and choose ONE word for each that has the same vowel pronunciation.

[25] <2> European
[26] <3> voluntary

① see ② set ③ cat ④ cut ⑤ bird ⑥ hot ⑦ home ⑧ star ⑨ pool ⑩ pull ⑪ air ⑫ tour

4. In the last two paragraphs, parts of the sentences < [27] >, < [28] >, and < [29] > are missing. Choose ONE answer for each to complete the sentences.

① occurs in less industrialized countries
② move a society toward zero population growth under conditions of low birth rates
③ if the birth rate does not change

5. [30] Based on the data written in the passage, which data set is most likely correct? Choose ONE answer.

Year	① Population	② Population	③ Population	④ Population
1650	500 million	500 million	500 million	500 million
1750	900 million	700 million	750 million	750 million
1850	1 billion	1 billion	1.8 billion	2 billion
1950	2 billion	2.8 billion	3 billion	4 billion
2050	8 billion	9 billion	10 billion	11 billion

6. [31] Which ONE of the following is NOT mentioned in connection with demographic transition?

① lower birth and death rates
② industrialization
③ better living conditions
④ quality of health care
⑤ access to education
⑥ global climate change

4 Read the passage below and then answer the questions [32] - [42] about it. Choose the most appropriate answers based on what is stated in the passage.

[Section A]

Creation and recall of memory is a three-part process. When something happens, first you have to encode* the information correctly; you have to notice the details and interpret them. Secondly, that information has to be passed into your short-term or long-term memory in a process called consolidation, which sees the neurons undergo chemical changes. Then thirdly, and this is often the challenging part, you have to retrieve that consolidated information. This process is a chemical reaction in the brain that causes the neurons to spark in a certain way, and can be completely involuntary and stimulated by a cue like a sound, sight or smell. When you struggle to recall a name or a piece of information, the connections between your neurons go into a state of excessive activity. [32] you know a memory as a person, smell or place, to your brain, a memory is a set of bridges that form and reform between neurons. "Memory retrieval involves brain regions all working together," explains Dr. Jee Hyun Kim, a research fellow at Australia's Florey Institute of Neuroscience and Mental Health.

After you recall a memory, it has to go back through the entire process of consolidation again. And that can be influenced by your emotions and experiences at the time. Each time you file a memory away, it is changed slightly, or can even be lost. That might explain why brothers or sisters sometimes have such different recollections of the same events. Everyone's memories are products of their own emotional perception, as well as electrical and chemical brain changes that <1> come into play each time a memory is formed. Retaining memory is highly dependent on the first step of the process, encoding the information. Often as we get older, we simply don't pay attention properly. "One of the most important things about losing memory is that maybe it was never encoded in the first place," says Kim.

[Section B]

We now understand memory well, but the next frontier is to understand why we forget. That will hold the key to treating memory-affected conditions such as Alzheimer's disease, and depression. The Human Brain Project is trying to do just that by bringing together experts from all over the world to develop a huge computer that would work just like the human brain. The aim is to <2> boost scientific research into neuroscience, medicine and computing. Such a computer would be 100 times faster than the fastest computers we have today. The technology isn't available yet, though the organizers are confident that by 2025 we will have the hardware we need to create a machine that can start to learn, think, see and hear like a brain.

But how possible is it? Professor Alice Parker of the University of Southern California, whose team in 2011 already produced the first artificial synapse (a component of a neuron), says this area of science is developing rapidly. [33] huge

computers, it will be possible to develop many processors that are as complex as the human brain, but the hard part is to find technology that can rearrange itself, that can re-make the connections to become as plastic as the human brain. While it certainly could be possible to develop a neuron and even to place it in a large system so it could form connections and communicate, what might be more challenging is to give it self-awareness. "That's the ultimate goal: can you turn a tangle of neurons into a conscious brain?" says Parker.

[Section C]

Perhaps the biggest breakthrough in brain science is our understanding of neuroplasticity*, that our thoughts can change the structure and function of our brains. First noted in the 1950s, when University of California Professor Mark Rosenzweig realized that rats [34] to stimulating environments were able to learn better, neuroplasticity has opened up new possibilities for us to improve our memory, creativity and ability to learn. Our 100 billion nerve cells have up to 10,000 connections and, unlike the wiring of a computer, these are changing all the time. Experience and practice reinforce the strength of these connections and make them more permanent. We now know that it is possible to change those pathways.

Take Barbara Arrowsmith Young, author of *The Woman Who Changed Her Brain*. Until her 20s she could recall facts and figures but not derive meaning from anything, like the meaning of the letters in a word. It was like she was in a fog. Having heard of neuroplasticity, she set about doing brain stimulation exercises to fire up the part of her brain that wasn't working. She practiced every day for about four months, and it worked. For the first time, she watched a TV program and understood its meaning. Now her methods have been used to teach thousands of similarly mentally challenged children in Canada.

The idea that you can change your brain holds potential for all of us, and computer programs designed to rewire our thoughts are changing treatments, from Alzheimer's disease to depression. "Whether we are hit hard on the head or have genetic faults that leave us struggling, we have the power to drive change for the better," says Professor Michael Merzenich, a pioneer in the study of neuroplasticity.

<<NOTES*>>
encode = to convert into a coded form
neuroplasticity = the brain's ability to form and reorganize neural connections

1. For [32] - [34] in the passage, choose the most appropriate answer from each list.

[32]	① Before	② So that	③ During	④ As if	⑤ While
[33]	① Use	② Use of	③ Using	④ To use	⑤ For the use of
[34]	① exposed	② experienced	③ rejected	④ neglected	⑤ were put

2. For <1> come into play and <2> boost, choose ONE answer for each that is closest in meaning from each list.

[35] <1> come into play
① attempt to do something ② form teams ③ perform in a play ④ give courage ⑤ be involved

[36] <2> boost
① launch a plan ② cause something to improve ③ consider something as acceptable ④ connect two or more things together ⑤ improve the power of an engine

3. [37] What happens in the brain when a person is trying to recall a memory? Choose ONE answer.

① The creation process happens in three parts.
② Consolidation of the memory stops.
③ The retrieval becomes quite a challenge.
④ A chemical reaction takes place.
⑤ The brain is stimulated by a sound.

4. [38] Why might two people have different recollections of the same events? Choose ONE answer.

① Memory consolidation occurs in reverse.
② Memories can change each time they are filed.
③ The event has changed slightly.
④ Memories are formed in different parts of the brain.
⑤ Event encoding never occurred in the first place.

5. For [39] - [42], use the words ①-⑧ to complete a presentation slide made for the passage. Choose ONE answer for each.

① Modeling ② Amazing ③ Creative ④ Program ⑤ Process ⑥ Challenging ⑦ Strengthen ⑧ Change

Presentation Slide