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(I) The potential medical applications of ultrasound were first recognised in the 1940s as an outgrowth of the sonar technology developed to detect submarines during World War II. (II) The first useful medical images were produced in the early 1950s, and by 1965, ultrasound quality had improved to the point that it came into general medical use. (III) The many types and uses of ultrasound technology make it difficult to generalise about the time and costs involved. (IV) Today, improvements in the technology, application, and interpretation of ultrasound still continue. (V) However, its low cost, safety and speed make it one of the best medical imaging techniques.

A) I B) II C) III D) IV E) V

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(I) Although much has been learned about human embryology in the last couple of decades, a great deal remains unknown. (II) Studying prenatal human development is difficult because the embryo and foetus develop in a closed environment — the mother's womb. (III) However, the relatively recent development of a number of prenatal tests has opened a window on the process. (IV) The foetus receives all nutrients and oxygen from blood that circulates through the placenta. (V) Add to that more accurate and complete evaluations of new-borns, especially those with problems, and a clearer picture of what can go wrong before birth is possible.

A) I B) II C) III D) IV E) V

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(I) Amnesia is simply the standard term for a loss of memory, whether partial or complete. (II) Research on patients with amnesia has led scientists to discover some interesting things about memory. (III) The condition is usually temporary, and it generally affects only a small part of a person's experience, such as memory of the immediate past. (IV) Amnesia can be produced by a range of causes, including both psychological trauma and brain damage that may be caused by a blow to the head. (V) It can also be due to such varied causes as stroke and brain tumour.

A) I B) II C) III D) IV E) V

Parkinson's disease, also called shaking palsy or paralysis agitans, is a slowly progressive disease of the nervous system in which an essential type of nerve cell located in a small part of the brain is destroyed. The cause of the disease is unknown, but there is speculation that a deficiency of vitamin E early in life may be responsible. Symptoms begin when there is an imbalance of two chemicals in the brain, dopamine and acetylcholine. These substances transfer messages between nerve cells that control muscle function. In Parkinsonism, the amount of dopamine is diminished, creating an imbalance that confuses nerve signals. Approximately 1 per cent of Americans over age 65 suffer from Parkinson's. Symptoms include muscular rigidity (first the legs, then the arms) and cramping, involuntary tremors, excessive salivation, impaired speech and a staring facial expression. Despite these symptoms, sensation and mental activity are not impaired. There is often a loss of appetite and some weight loss, giving rise to the possibility of malnutrition developing. There is no cure for the disease, although drugs are prescribed to alleviate the symptoms. Along with medication, alternative therapies are also sometimes included in treatment.

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*It can be understood from the passage that Parkinson's disease ---.*

- A)** appears as a result of destruction of a particular nerve cell in the brain of people over the age of 65
- B)** can be attributed to the lack of a certain vitamin type in the first stages of life, though there is no agreement on the claim
- C)** causes a decrease in the amounts of dopamine and acetylcholine in the brain
- D)** marks its onset especially after the age of 65 as it is the case in the majority of American patients
- E)** may be slowed down if the progression of nerve cell destruction can be stopped via chemicals

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*According to the passage, Parkinson's disease ---.*

- A)** can be triggered if the body fails to release adequate amount of dopamine
- B)** can be easily diagnosed via close examination of legs and arms when they lose their flexibility due to the illness
- C)** can cause patients to experience the extremes of excitement and nervousness due to their impaired brain chemistry
- D)** can be accompanied by a deterioration in the mental abilities of patients due to their old age
- E)** can be treated with medications and alternative therapies, though a full recovery is impossible

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*What is the main purpose of the passage?*

- A)** To give brief information regarding the onset and progression of Parkinson's disease
- B)** To highlight the difficulties patients with Parkinson's disease face
- C)** To show how dietary habits can influence the healthy brain function
- D)** To falsify the speculations about the impact of malnutrition on developing Parkinson's disease
- E)** To criticise the lack of experimental research on viable treatment methods for Parkinson's disease

Every human being enters the world with a remarkably unfinished brain. Dolphins are born swimming; giraffes learn to stand within hours. But humans are helpless for years. However, this seeming limitation actually signals humans' greatest advantage. Baby animals develop quickly because their brains wire up according to a pre-programmed routine. But that preparedness trades off with flexibility. Imagine if an unlucky rhinoceros found itself on the Arctic tundra or on top of a mountain in the Himalayas or in the middle of urban Tokyo. It would have no capacity to adapt or thrive. In contrast, humans have thrived in all these environments. Instead of arriving with everything hardwired, a human brain is shaped by life experience. It is 'livewired'. Our brains' flexibility derives not from the growth of new cells but from how those cells are connected. A baby's neurons form two million new connections every second as they take in information. By age 2, a child has over 100 trillion synapses – double the number an adult has. This peak represents far more connections than the brain will need. The incredible blooming is then supplanted by neural 'pruning'. As you mature through the teen years and into your 20s, 50 per cent of your synapses will be reduced by a large amount.

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*It is clearly stated in the passage that compared to animals, humans ----.*

- A)** are born with better survival skills enabling them to survive in nature
- B)** can survive in extreme or harsh environments thanks to their livewired brain
- C)** initially focus on developing pre-programmed routines for adaptation
- D)** depend on their flexibility to produce new brain cells
- E)** may lose their ability to adjust to harsh environments as they age

- A)** is more flexible in growing scheduled routines
- B)** improves its connection ability with age
- C)** uses experiences to make much more connections in adulthood
- D)** is better at drawing connections among cells than those of animals
- E)** improves its function by losing some of the connections

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*It is inferred from the passage that having a pre-programmed routine ----.*

- A)** would promote learning through experiences to perform essential tasks to survive
- B)** might prevent people from acquiring new survival skills and methods
- C)** is the major factor for the decrease in the number of synapses in animals
- D)** will slow the brain down while growing new brain cells
- E)** is an obstacle for animals to adapt to a completely different habitat with ease

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*According to the passage, human brain ----.*

Pharmacogenetics is the exploration of the relationship between inherited genes and the ability of the body to metabolise drugs. Although research interests are rapidly expanding, pharmacogenetics research mainly concentrates on trying to establish connections between the genes carried by an individual (genotype) and specific reactions to drugs (e.g., side effects, toxicities, etc.). Modern medicine relies on the use of therapeutic drugs to treat disease, but one of the longstanding problems has been the documented variation in patient response to drug therapy. The recommended dosage is usually established at a level shown to be effective in 50% of a test population, and based on the patient's initial response, the dosage may be increased, decreased, or discontinued. In rare situations, the patient may experience an adverse reaction to the drug and be shown to have a pharmacogenetic disorder. The unique feature of this group of diseases is that the problem does not occur until after the drug is given, so a person may have a pharmacogenetic defect and never know it if the specific drug required to trigger the reaction is never administered.

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*Why does the author mention patient response variation in drug therapy?*

- A)** To emphasise the importance of adhering to recommended dosages
- B)** To explain why pharmacogenetic disorders get less attention than they deserve
- C)** To demonstrate the challenges faced in drug administration
- D)** To highlight the contribution of external factors to drug rejection
- E)** To underline the role of rare genetic mutations in drug interactions

*pharmacogenetic disorder from others?*

- A)** It develops following the intake of increased dosages of certain drugs.
- B)** It becomes evident after drug administration.
- C)** Its effects can be alleviated by adjusting the dosage properly.
- D)** It primarily affects the patient's metabolism.
- E)** It is unrelated to the use of therapeutic drugs.

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*What is the main idea of the passage?*

- A)** There is meticulous research conducted on the body to metabolise drugs.
- B)** Adverse reactions to drugs are more common than previously thought.
- C)** Genetic mutations primarily occur due to exposure to toxins.
- D)** Dosages of therapeutic drugs need to be adjusted regularly.
- E)** Patient responses to drug therapy are influenced by genetics.

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*According to the passage, what distinguishes a*

Adjustment disorders are a group of disorders in which a person's psychological response to a stressor triggers symptoms that require clinical attention. Even though this disorder is so commonly diagnosed, there have been few large-scale epidemiological studies targeting this disorder. It appears to be fairly common in the American population; recent figures estimate that 5–20% of adults seeking outpatient psychological treatment have one of the subtypes of this disorder. As many as 70% of children in psychiatric inpatient settings may be diagnosed with an adjustment disorder. In a questionnaire sent to child psychiatrists in the early 1990s, 55% admitted to giving children the diagnosis of an adjustment disorder to avoid the stigma associated with other disorders. On the other side, women are diagnosed with adjustment disorder twice as often as men, and diagnosis is also more frequent in females among adolescents. There are no current studies of differences in the frequency of adjustment disorder in different racial or ethnic groups. There is, however, some potential for bias in diagnosis.

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*It is clear from the passage that studies of adjustment disorders ----.*

- A)** mainly address children living in America as they are the largest group
- B)** are not so high in numbers despite the disorder being so widespread
- C)** strongly attacked the attention of psychiatrists in the early 1990s due to rising problems
- D)** show that most people with the disorder look for outpatient psychological treatment
- E)** have been carried out extensively for the last three decades in America

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*It is understood from the passage that diagnosis of adjustment disorders ----.*

- A)** presents similar results between some cultural groups
- B)** is challenging because of their vulnerability for bias
- C)** shows differences in numbers between different groups of people
- D)** is more common in both male and female adolescents compared to adults
- E)** has a rising trend in psychiatric inpatient settings according to recent studies

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*What is the main purpose of this passage?*

- A)** To provide information about the reasons why adjustment disorders are so common
- B)** To compare groups of people with respect to the diagnosis of adjustment disorders
- C)** To give brief information about what adjustment disorders are
- D)** To show different insights about adjustment disorders
- E)** To show the difference between men and women who are diagnosed with adjustment disorders

In the 6th century there was no significant understanding of bacteria and their role in the spread of diseases, and nothing was yet known anywhere about genes and their critical influence in determining who survived and who did not. These are the reasons for the perplexity experienced by the physicians when they tried their best to save the sick and the results were disappointing. It was the same centuries later when the same Black Death that overtook Constantinople in 542 swept over London in 1665. Many people in London, such as gravediggers, who were constantly exposed to infected bodies, stayed quite healthy while those who had just a single exposure to the infection died within two days. In 1990s, researchers solved the problem. Those who had a particular gene, commonly known as Delta 32, did not catch the disease if they inherited this gene from both parents. If they received the gene from only one parent, they got sick but they recovered.

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*According to the passage, the physicians of the 6th century ----.*

- A) estimated that close to half the population of Constantinople died from the Black Death
- B) pointed out that in the first day of infection nothing very serious was evident
- C) developed a deep sense in understanding of many diseases but failed to cure them
- D) tried very hard to cure the Black Death but the results were disappointing
- E) believed that only those who buried the infected bodies would die

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*Why were some people exposed to infected bodies not affected by the plague?*

- A) They had inherited a specific gene that made them immune to the Black Death.
- B) They used special tools and garments when discarding the bodies of the afflicted.
- C) The doctors treated them with a gene that could escape consequences of that particular infection.
- D) They went into a deep coma before they could recover from the Black Death.
- E) Their constant exposure to the infected people helped develop their immune system.

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*The passage is mainly about ----.*

- A) the Black Death and its unfortunate effects on Constantinople and London
- B) Delta 32 gene, which changed the course of infection treatment
- C) the significance of inheritance in a devastating disease of the past
- D) the history of the ancient plagues that ravaged Europe
- E) our comprehension of the past diseases and how we treated them