Question 1:

'A police officer carries out hundreds of traffic stops every year. When his supervisor is reviewing the officer's records for the past year, he notices that the officer is equally likely to stop people of various genders, ages, and races. However, he is significantly more likely to write tickets for middle-aged white males with dark hair and eyes. When confronted with this fact, the officer truthfully states that he has no idea why that is, and that it must simply be a coincidence. Unbeknownst to the officer, this behavior is tied to the fact that these men look like his father, with whom he had an abusive relationship as a child. What psychological framework would directly address the unconscious bias in his behavior? ', A. 'Behaviorist', B. 'Psychoanalytic', C. 'Cognitive behavioral', D. 'Humanistic'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 2:

'Who set the world record for the mile race in 1886?', A. 'R Bannister', B. 'S Coe', C. 'J DiMaggio', D. 'WG George'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 3:

'Which of the following statements identifies a chemically based sensory system?

I. Gustatory system

II. Auditory system

III. Olfactory system', A. 'I only', B. 'II only', C. 'III only', D. 'I and III only'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 4:

'The complete resynthesis of phosphocreatine after very high intensity exercise normally takes:', A. 'about 10 seconds.', B. 'about 30 seconds.', C. 'about 1 minute.', D. 'about 4 minutes.'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 5:

'A race car attempting to jump a series of 8 buses is set up on a flat track with a ramp at the end. Engineers assigned to the project have determined that, in order to jump the buses, the car must reach a velocity of 130 km/h. If the distance of the track is 50m, at what rate must the car accelerate to reach this velocity?', A. '13 m/s^2', B. '26 m/s^2', C. '7 m/s^2', D. '17 m/s^2'

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Answer Option 1:

Final Answer: A

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: A

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Answer Option 5:

Final Answer: A

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 6:

'Fatty acids are transported into the mitochondria bound to:', A. 'thiokinase.', B. 'coenzyme A (CoA).', C. 'acetyl-CoA.', D. 'carnitine.'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 7:

'Sauna use, sometimes referred to as "sauna bathing," is characterized by short-term passive exposure to extreme heat. This exposure elicits mild hyperthermia – an increase in the body's core temperature – that induces a thermoregulatory response involving neuroendocrine, cardiovascular, and cytoprotective mechanisms that work together to restore homeostasis and condition the body for future heat stressors… In recent decades, sauna bathing has emerged as a means to increase lifespan and improve overall health, based on compelling data from observational, interventional, and mechanistic studies. Of particular interest are the findings from studies of participants in the Kuopio Ischemic Heart Disease Risk Factor (KIHD) Study, an ongoing prospective population-based cohort study of health outcomes in more than 2,300 middle-aged men from eastern Finland, which identified strong links between sauna use and reduced death and disease… The KIHD findings showed that men who used the sauna two to three times per week were 27 percent less likely to die from cardiovascular-related causes than men who didn't use the sauna.[2] Furthermore, the benefits they experienced were found to be dose-dependent: Men who used the sauna roughly twice as often, about four to seven times per week, experienced roughly twice the benefits – and were 50 percent less likely to die from cardiovascular-related causes.[2] In addition, frequent sauna users were found to be 40 percent less likely to die from all causes of premature death. These findings held true even when considering age, activity levels, and lifestyle factors that might have influenced the men's health.[2]... The KIHD also revealed that frequent sauna use reduced the risk of developing dementia and Alzheimer's disease in a dose-dependent manner. Men who used the sauna two to three times per week had a 66 percent lower risk of developing dementia and a 65 percent lower risk of developing Alzheimer's disease, compared to men who used the sauna only one time per week… The health benefits associated with sauna use extended to other aspects of mental health, as well. Men participating in the KIHD study who used the sauna four to seven times per week were 77 percent less likely to develop psychotic disorders, regardless of the men's dietary habits, socioeconomic status, physical activity, and inflammatory status (as measured by C-reactive protein)…Exposure to high temperature stresses the body, eliciting a rapid, robust response. The skin and core body temperatures increase markedly, and sweating ensues. The skin heats first, rising to 40°C (104°F), and then changes in core body temperature occur, rising slowly from 37°C (98.6°F, or normal) to 38°C (100.4°F) and then rapidly increasing to 39°C (102.2°F)… Cardiac output, a measure of the amount of work the heart performs in response to the body's need for oxygen, increases by 60 to 70 percent, while the heart rate (the number of beats per minute) increases and the stroke volume (the amount of blood pumped) remains unchanged.[5] During this time, approximately 50 to 70 percent of the body's blood flow is redistributed from the core to the skin to facilitate sweating. The average person loses approximately 0.5 kg of sweat while sauna bathing.[11] Acute heat exposure also induces a transient increase in overall plasma volume to mitigate the decrease in core blood volume. This increase in plasma volume not only provides a reserve source of fluid for sweating, but it also acts like the water in a car's radiator, cooling the body to prevent rapid increases in core body temperature and promoting heat tolerance… Repeated sauna use acclimates the body to heat and optimizes the body's response to future exposures, likely due to a biological phenomenon known as hormesis, a compensatory defense response following exposure to a mild stressor that is disproportionate to the magnitude of the stressor. Hormesis triggers a vast array of protective mechanisms that not only repair cell damage but also provide protection from subsequent exposures to more devastating stressors… The physiological responses to sauna use are remarkably similar to those experienced during moderate- to vigorous-intensity exercise. In fact, sauna use has been proposed as an alternative to exercise for people who are unable to engage in physical activity due to chronic disease or physical limitations.[13]

Based on the article, which of the following statements is the author likely to agree with?', A. 'Heart surgery patients who cannot run on treadmills may benefit from sauna use.', B. 'Patients on a diet would benefit from sauna use.', C. 'Salt restriction would be equal to sauna use for hypertensive patients.', D. 'Patients with skin conditions may be cured with sauna use.'

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Answer Option 1:

Final Answer: A

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Answer Option 2:

Final Answer: A

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Answer Option 3:

Final Answer: A

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Answer Option 4:

Final Answer: A

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Answer Option 5:

Final Answer: A

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Answer Option 6:

Final Answer: A

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Answer Option 7:

Final Answer: A

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Answer Option 8:

Final Answer: A

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Answer Option 9:

Final Answer: A

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Question 8:

'Diisopropylfluorophosphate (DFP) binds to the active site of acetylcholinesterase (ACE) in the synapses of neurons. When DFP binds to ACE, the ACE enzyme is rendered permanently inactive. This makes DFP a potent toxin, with lethal amounts at less than 100 mg. The interaction between DFP and ACE can best be characterized as:', A. 'Competitive inhibition', B. 'Noncompetitive inhibition', C. 'Irreversible inhibition', D. 'Partially competitive inhibition'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: C

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: C

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: C

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Answer Option 8:

Final Answer: C

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Answer Option 9:

Final Answer: C

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Question 9:

'The process of translation requires the presence of:', A. 'mRNA, tRNA and ribosomes.', B. 'mRNA, ribosomes and RNA polymerase.', C. 'DNA, mRNA and RNA polymerase.', D. 'chromatin, DNA and amino acids.'

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Answer Option 1:

Final Answer: A

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Answer Option 2:

Final Answer: A

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Answer Option 3:

Final Answer: A

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Answer Option 4:

Final Answer: A

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Answer Option 5:

Final Answer: A

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Answer Option 6:

Final Answer: A

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Answer Option 7:

Final Answer: A

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Answer Option 8:

Final Answer: A

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Answer Option 9:

Final Answer: A

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Question 10:

'Performance enhancing synthetic steroids are based on the structure of the hormone:', A. 'testosterone.', B. 'cortisol.', C. 'progesterone.', D. 'aldosterone.'

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Answer Option 1:

Final Answer: A

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Answer Option 2:

Final Answer: A

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Answer Option 3:

Final Answer: A

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Answer Option 4:

Final Answer: A

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Answer Option 5:

Final Answer: A

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Answer Option 6:

Final Answer: A

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Answer Option 7:

Final Answer: A

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Answer Option 8:

Final Answer: A

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Answer Option 9:

Final Answer: A

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Question 11:

'Perchloric acid (HClO4) is considered one of the stronger acids in existence. Which of the following statements corresponds most accurately with strong acids?', A. 'Ka is less than 1', B. 'They have an open electron spot on their outer valence rings', C. 'They have stable conjugate bases', D. 'They remain bound in the presence of water.'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: C

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: C

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: C

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Answer Option 8:

Final Answer: C

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Answer Option 9:

Final Answer: C

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Question 12:

'A descript amount of 2-bromobutane is placed into a strong solution of ethanol and allowed to complete a reaction. The result of this reaction produces a major product of 2-butene and a minor product of 1-butene. Which of the following descriptions of the starting compound explains why 2-butene is the major product?', A. 'Carbon 3 has less hydrogen atoms', B. '1-butene rearranges to 2-butene in solution', C. 'Ethanol prefers the second carbon in any chain', D. 'Cyclic aromatization'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: A

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: A

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: A

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 13:

'A hedonic teenager of wayward morals, in one night, sequentially i) has consensual sexual intercourse with his sister, ii) leaves no tip at the bar, iii) has non-censual sexual relations with an unknown woman, and iv) vomits on the steps to the door of a local church. The teenager has violated society's norms sequentially (to the greatest degree) on the order of:', A. 'mores, mores, the law, mores', B. 'taboo, folkways, the law, and taboo', C. 'the law, folkways, folkways, and folkways', D. 'taboo, folkways, the law, and mores'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 14:

'The maximum sustainable power:', A. 'usually remains constant during a race.', B. 'declines with the distance of the race.', C. 'is improved by a high fat diet.', D. 'is inversely related to muscle glycogen content.'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 15:

'A patient comes into the ER looking extremely agitated. They are acting aggressive, and claiming they need medication or “bad things will happen”. What is the likely state of this patient’s dopamine system?', A. 'There is decreased dopamine in the synaptic cleft.', B. 'There are decreased dopamine receptors on the post-synaptic membrane.', C. 'There is cell death in the areas with high dopamine cells.', D. 'There is seizure-like activity in the dopamine brain areas.'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 16:

'A scientist carrying out experiments on hearing aids fits 30 mice that were genetically modified to lose their hearing with the latest technology and were tested to press a lever when they heard a bell. This was set to varying levels of power. At 80% power, 20 mice pressed the lever. At 70% power, 15 mice pressed the lever. At 60% power, 10 mice pressed the lever. Which of the following power levels corresponds to the absolute threshold for hearing the decibels produced by the bell?', A. '80%', B. '70%', C. '60%', D. 'Not enough information given.'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: C

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Answer Option 8:

Final Answer: C

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Answer Option 9:

Final Answer: D

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Question 17:

'The transcription of DNA to a molecule of messenger RNA occurs:', A. 'on the ribosomes.', B. 'in the cytosol.', C. 'in the nucleus.', D. 'only during cell division.'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: C

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: C

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: C

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Answer Option 8:

Final Answer: C

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Answer Option 9:

Final Answer: C

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Question 18:

'A new enzyme is found in a transgenic mice that participates in synthesis of an unknown product using two reactants. When using radiolabeled compounds to study the enzyme, it is found that the enzyme catalyzes a process that switches a nitrogen group on one reactant to the other reactant. Which of the following categories would this new enzyme fall under?', A. 'Oxidoreductase', B. 'Transferase', C. 'Hydrolase', D. 'Lyase'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 19:

'For a very weak base, the pKb of a solution would likely be:', A. 'Equal to the pOH', B. 'Higher than the pOH', C. 'Lower than the pOH', D. 'Near 7 at 25ºC'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 20:

'The genome is:', A. 'the number of chromosomes found in the somatic cells of an organism.', B. 'the entire DNA sequence of an organism.', C. 'the entire list of proteins that an organism is capable of producing.', D. 'the DNA sequence of an entire chromosome.'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 21:

'Which of the following are steroid-based molecules?

I. Testosterone

II. Triglycerides

III. Progesterone

IV. DNA', A. 'I only', B. 'I, II, and III', C. 'I and III', D. 'I, III, and IV'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: C

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: C

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: C

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Answer Option 8:

Final Answer: C

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Answer Option 9:

Final Answer: C

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Question 22:

'Most of the free fatty acids are transported in the blood:', A. 'inside the red blood cells.', B. 'as lipoproteins.', C. 'combined with glucose.', D. 'bound to albumin.'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 23:

'Which of the following factors can affect enzyme activity?', A. 'Temperature.', B. 'pH.', C. 'The presence of certain metal ions.', D. 'All of the above.'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 24:

'Living cells require constant interaction with the outside environment in order to attain the materials they need for survival, as well as to rid themselves of waste. Of the following processes, which uses only the gradient of material to control the direction in which the material moves across the cell membrane?', A. 'Osmosis', B. 'Passive Transport', C. 'Active Transport', D. 'Endocytosis'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: A

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 25:

'Embedded in the inner membrane of the mitochondrion are:', A. 'the enzymes of the tricarboxylic acid cycle (Krebs' cycle).', B. 'the components of the electron transport chain.', C. 'glycogen molecules.', D. 'triacylglycerol molecules.'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 26:

'A segment of DNA from a lab mouse is determined to be 5' – GGATCCTCATG – 3'. Which of the following DNA segments would be the result of this original DNA sequence experiencing both a point mutation and a deletion?', A. '5' – GCATCCTCATG – 3'', B. '5' – TGATCCCAG – 3'', C. '5' – GGTCCTCATC – 3'', D. '5' – GGATCCATG – 3''

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 27:

'While working on a scene for an action movie, a sound technician is given the task of changing the frequency of a gunshot to more accurately reflect the normal speed of sound. The gunshot came from an actor inside a car traveling 108 km/h, and it was recorded by a camera on a platform 200 meters away traveling at 72 km/h in the same direction. If the frequency of the gunshot is normally 800Hz, what is the perceived frequency which the camera picks up the gunshot at?', A. '941 Hz', B. '787 Hz', C. '924 Hz', D. '912 Hz'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: C

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: D

****

Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: C

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Question 28:

'An object rests on a plane, with an angle of incline, ?, an acceleration due to gravity, g, and a coefficient of friction μ between the object and the plane. Which of the following gives the acceleration of the object?', A. 'a = g sin ?', B. 'a = g (sin ? – cos ?)', C. 'a = g (cos ? – μ sin ?)', D. 'a = g (sin ? – μ cos ?)'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 29:

'David is a nationally ranked cellist who recently accepted a scholarship to a major college to perform in the orchestra. Over the summer, he has been given a packet of sheet music to be proficient in by fall semester. David is a perfectionist when it comes to his craft. He always compares himself to better players, and is very hard on himself when he cannot master a section of one of his pieces. Which of the following answers best describes David?', A. 'Low self-esteem, strong self-efficacy, internal locus of control', B. 'High self-esteem, strong self-efficacy, internal locus of control', C. 'Low self-esteem, strong self-efficacy, external locus of control', D. 'Low self-esteem, low self-efficacy, internal locus of control'

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Answer Option 1:

Final Answer: A

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Answer Option 2:

Final Answer: A

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Answer Option 3:

Final Answer: A

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Answer Option 4:

Final Answer: A

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Answer Option 5:

Final Answer: A

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Answer Option 6:

Final Answer: A

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: A

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Question 30:

'A common heart defect in humans is a ventricular septal defect, in which there is a hole in the septum between the right and left ventricles. If a patient were to have this defect, which of the following statements is correct?', A. 'The percentage of oxygen in the left atrium would be lower.', B. 'The percentage of CO2 in the right ventricle would be higher.', C. 'The percentage of oxygen in the right atrium would be lower.', D. 'The percentage of oxygen in the right ventricle would be higher.'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 31:

'When preparing for the MCAT exam, a student begins studying electrochemical cells. He learns the basic information needed by actively relating it to previous information he has learned about redox reactions. He then builds from that knowledge to learn the advanced concepts needed. The student’s process is best characterized as:', A. 'Chunking', B. 'A network model', C. 'Maintenance rehearsal', D. 'Elaborative rehearsal'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 32:

'Two scientists at a conference on evolution take to the stage on day 3 to argue their theories against one other. Each is a devout student of their own philosophy. The first scientist contends that organisms evolved via the increase of organs that were used the most during their time. They would then pass these on to subsequent generations. The second scientist, however, believed that advantages each organism possessed were absent for a long time, randomly occurred, and when they were beneficial, that organism would rapidly populate the population over a short period of time, evolutionarily speaking. Which of the following statements would strengthen the second scientist's argument?', A. 'A study that shows that bodybuilders who train more have larger children.', B. 'A taxonomy study that shows long periods of stagnant growth followed by short burst of massive evolution.', C. 'A study that showed a species who were more successful due to the things they learned over their lifetime that they passed on to their children.', D. 'A study that showed a consistent amount of time between the emergence of each new species.'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 33:

'A source emits a sound from one medium with a certain velocity, intensity, frequency and wavelength. When the sound exits the first medium and enters a denser medium, all of the following changes EXCEPT:', A. 'velocity', B. 'intensity', C. 'frequency', D. 'wavelength'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: C

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: C

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: C

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Answer Option 8:

Final Answer: C

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Answer Option 9:

Final Answer: C

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Question 34:

'The energy charge of the cell is:', A. 'the difference between the charge on the outside and inside of a cell.', B. 'generated by the sodium-potassium ATPase.', C. 'the overall rate of energy use by the cell.', D. 'the extent to which the total adenine nucleotide pool is phosphorylated.'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 35:

'The body compensates for increased environmental temperature by:', A. 'decreasing salt retention', B. 'increasing respiration rate', C. 'increasing heart rate', D. 'increasing water lost through skin'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 36:

'Which of the following releases most energy when completely oxidised in the body?', A. 'One gram of glucose', B. 'One gram of palmitic acid', C. 'One gram of leucine', D. 'One gram of alcohol'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 37:

'An individual is born with a mutation causing her to partially retain a form of fetal hemoglobin into adulthood. Compared to a normal individual, this person would exhibit:', A. 'no differences from a normal adult.', B. 'significantly reduced oxygen binding in the lungs.', C. 'no symptoms, since retention of fetal hemoglobin would be fatal.', D. 'increased oxygen binding to hemoglobin in the tissues.'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 38:

'Women's world record performances have improved rapidly in recent years mainly because:', A. 'women have evolved a greater muscle mass.', B. 'women can now run faster than men.', C. 'women have started training at an earlier age.', D. 'more women are now engaged in sport.'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 39:

'During muscular contraction, interactions between myosin and actin allow for shortening of each sarcomere. In addition to the power stroke, what other process of muscle contraction requires ATP?', A. 'Tropomyosin-troponin interaction', B. 'Myosin-actin interaction', C. 'Calcium-troponin interaction', D. 'Myosin-actin detachment'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 40:

'The activity of creatine kinase is:', A. 'increased when intracellular ADP rises.', B. 'increased when muscle pH falls below 6.9.', C. 'always lower in Type II fibres than Type I fibres.', D. 'increased after a period of endurance training.'

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Answer Option 1:

Final Answer: A

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Answer Option 2:

Final Answer: A

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Answer Option 3:

Final Answer: A

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Answer Option 4:

Final Answer: A

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Answer Option 5:

Final Answer: A

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Answer Option 6:

Final Answer: A

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Answer Option 7:

Final Answer: A

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Answer Option 8:

Final Answer: A

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Answer Option 9:

Final Answer: A

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Question 41:

'A teacher sets up a reward system for her elementary school students. At the end of each day, she gives a sticker to each student who showed up on time that morning. At the end of each week, she gives a sticker to any student who got above a 90% on three quizzes in a row. After months of this regimen, she finds that performance on the quizzes has increased significantly but that tardiness has only decreased slightly. Which of the following best explains the teacher's observation?', A. 'Variable ratio schedules create the strongest responses and behavior that is the least susceptible to extinction.', B. 'The students had more intrinsic motivation to do well on quizzes than to show up on time.', C. 'The students' behavior change was stronger in response to a fixed-ratio schedule than it was to a continuous reinforcement schedule.', D. 'The students' behavior change was stronger in response to a fixed-ratio schedule than it was to a variable-interval schedule.'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 42:

'The net production of ATP via substrate-level phosphorylation in glycolysis is:', A. '2 from glucose and 3 from glycogen.', B. '2 from glucose and 4 from glycogen.', C. '3 from glucose and 4 from glycogen.', D. '3 from glucose and 2 from glycogen.'

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Answer Option 1:

Final Answer: A

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: A

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Answer Option 6:

Final Answer: A

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: A

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Answer Option 9:

Final Answer: A

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Question 43:

'Pregnancy tests are extremely sensitive and function by detecting levels of B-hCG, or human chorionic gonadotropin, in urine. This hormone is secreted by what tissue, and what is its function?', A. 'Corpus luteum, self-maintenance', B. 'Endometrium, cell division', C. 'Blastocyst, increase in blood flow', D. 'Blastocyst, corpus luteum maintenance'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 44:

'The son of a bricklayer goes to college and i) becomes a teacher at a medical school, ii) gets promoted to tenured professor, and iii) moves across the country for a new tenured professor position at a different school. Sequentially, this man has experienced:', A. 'intergenerational mobility with respect to the father, horizontal mobility, horizontal mobility', B. 'intragenerational mobility with respect to the son, upward mobility, upward mobility', C. 'intergenerational mobility with respect to the father, upward mobility, horizontal mobility', D. 'intragenerational mobility with respect to the son, horizontal mobility, upward mobility'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: C

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: C

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: C

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Answer Option 8:

Final Answer: C

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Answer Option 9:

Final Answer: C

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Question 45:

'DNA polymerase creates new DNA by adding complimentary nucleotides to a template strand from the original double-stranded DNA. If a section of the template strand had a ration of 3:2 of A:T bases, what is the ration of A:T in the newly synthesized complimentary strand of DNA?', A. '3:02', B. '1:01', C. '2:03', D. 'cannot be determined'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: C

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: C

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: C

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Answer Option 8:

Final Answer: C

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Answer Option 9:

Final Answer: C

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Question 46:

'How many CO2 and ATP molecules are formed during one complete turn of the tricarboxylic acid cycle (Krebs' cycle)?', A. '2CO2 and 2ATP', B. '2CO2 and 16ATP', C. '2CO2 and 12ATP', D. '2CO2 and 1ATP'

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Answer Option 1:

Final Answer: D

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Answer Option 2:

Final Answer: D

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Answer Option 3:

Final Answer: D

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Answer Option 4:

Final Answer: D

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Answer Option 5:

Final Answer: D

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Answer Option 6:

Final Answer: D

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Answer Option 7:

Final Answer: D

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Answer Option 8:

Final Answer: D

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Answer Option 9:

Final Answer: D

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Question 47:

'A young child is brought to a psychologist for evaluation of their home situation. The child is placed in the middle of the floor, with the mother on one side and the psychologist on the other. The mother then leaves for a short while, and then returns. Which of the following would be a concerning sign during this evaluation?', A. 'Decreased exploration when the mother is out of the room.', B. 'Crying and returning to the mother upon return.', C. 'Avoiding the mother upon return.', D. 'Exploring the room before the mother leaves.'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: C

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: C

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: C

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Answer Option 8:

Final Answer: C

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Answer Option 9:

Final Answer: C

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Question 48:

'In a fit of passion, the spectator of a political debate exclaims that “welfare recipients are all lazy.” The spectator’s thought process is an example of:', A. 'prejudice', B. 'discrimination', C. 'ethnocentrism', D. 'conflict theory'

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Answer Option 1:

Final Answer: A

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Answer Option 2:

Final Answer: A

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Answer Option 3:

Final Answer: A

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Answer Option 4:

Final Answer: A

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Answer Option 5:

Final Answer: A

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Answer Option 6:

Final Answer: A

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Answer Option 7:

Final Answer: A

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Answer Option 8:

Final Answer: A

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Answer Option 9:

Final Answer: A

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Question 49:

'Neonatal Respiratory Distress Syndrome (NRDS) is a serious complication seen in infants born prematurely who have a compromised ability to facilitate oxygen diffusion across their alveolar membranes. This is caused by inadequate surfactant production. What role does surfactant play in facilitating oxygen diffusion?', A. 'Increases surface permeability', B. 'Maintains alveoli in an open state', C. 'Depresses cilia of the lung', D. 'Dilates blood vessels'

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Answer Option 1:

Final Answer: B

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Answer Option 2:

Final Answer: B

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Answer Option 3:

Final Answer: B

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Answer Option 4:

Final Answer: B

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Answer Option 5:

Final Answer: B

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Answer Option 6:

Final Answer: B

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Answer Option 7:

Final Answer: B

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Answer Option 8:

Final Answer: B

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Answer Option 9:

Final Answer: B

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Question 50:

'Using this formula, if a reaction was provided with 84g of ethane and unlimited oxygen, how many grams of carbon dioxide would result (Carbon atomic weight: 12amu, Hydrogen atomic weight: 1amu, Oxygen atomic weight: 16amu)?

■

The unbalanced reaction of ethane gas to carbon dioxide and water is as follows:

C2H4 + O2 —> CO2 + H2O', A. '78g', B. '528g', C. '264g', D. '156g'

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Answer Option 1:

Final Answer: C

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Answer Option 2:

Final Answer: C

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Answer Option 3:

Final Answer: C

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Answer Option 4:

Final Answer: C

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Answer Option 5:

Final Answer: C

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Answer Option 6:

Final Answer: C

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Answer Option 7:

Final Answer: C

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Answer Option 8:

Final Answer: C

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Answer Option 9:

Final Answer: C

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