February 2021: Kaplan MCAT stumpers put premeds to the test

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If you’re preparing for the Medical College Admission Test (MCAT), you will want to consult the experts. These selections from Kaplan’s MCAT Question of the Day series can help you sharpen your skills as you prepare to begin your potential journey into medical training.

The questions below come from three of the four MCAT sections—biological and biochemical foundations of living systems; chemical and physical foundations of biological systems; and psychological, social, and biological foundations of behavior. A fourth section, critical analysis and reasoning skills (commonly referred to as CARS), is based largely on inference.

Medicine can be a career that is both challenging and highly rewarding but figuring out a medical school’s prerequisites and navigating the application process can be a challenge unto itself. For students preparing for the medical school, the AMA premed glossary guide has the answers to frequently asked questions.

For those already in medical school, the AMA selected Kaplan as a preferred provider to support you in reaching your goal of passing the USMLE® or COMLEX-USA®. AMA members can save 30% on access to additional study resources, such as Kaplan’s Qbank and High-yield courses.

Section: Biological and biochemical foundations of living systems

**Question:** What role does peptidyl transferase play in protein synthesis?

**A.** It transports the initiator aminoacyl-tRNA complex.
B. It helps the ribosome to advance three nucleotides along the mRNA in the 5' to 3' direction.

C. It holds the proteins in its tertiary structure.

D. It catalyzes the formation of a peptide bond.

The correct answer is D.

Kaplan explains why: Peptidyl transferase is an enzyme that catalyzes the formation of a peptide bond between the incoming amino acid in the A site and the growing polypeptide chain in the P site. Initiation and elongation factors help transport charged tRNA molecules into the ribosome and advance the ribosome down the mRNA transcript, as in choices (A) and (B). Chaperones maintain a protein’s three-dimensional shape as it is formed, as in choice (C).

Section: Chemical and physical foundations of biological systems

Question: The body’s pH is tightly regulated because specific enzymes function best within a narrow pH range. What is the approximate pH of a $1.2 \times 10^{-5}$ M aqueous solution of NaOH?

A. 4.92.
B. 7.5.
C. 9.08.
The correct answer is C.

Kaplan explains why: NaOH is a strong base; as such, there will be $1.2 \times 10^{-5}$ M OH$^-$ in solution. Based on this information alone, the pOH must be between 4 and 5, and the pH must be between 9 and 10. Using the shortcut, pOH ? 5 – 0.12 = 4.88. pH = 14 – pOH = 9.12 (actual = 9.08).

Section: Psychological, social and biological foundations of behavior

Question: A woman notices that her father has started to move his fingers in such a way that it looks like he is rolling something, despite nothing actually being there. She also notes slowed movement and a shuffling gait. Which neurotransmitter is likely to be present in decreased levels in her father’s brain?

A. Epinephrine.
B. Histamine.
C. Dopamine.
D. Serotonin.
The correct answer is C.

Kaplan explains why: The symptoms indicate that the woman’s father likely has Parkinson’s disease. This disease is caused by decreased dopamine production in the substantia nigra