April 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 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: Why are triacylglycerols used in the human body for energy storage?

A. They are highly hydrated, and therefore can store lots of energy.

B. They always have short fatty acid chains, for easy access by metabolic enzymes.
C. The carbon atoms of the fatty acid chains are highly reduced, and therefore yield more energy upon oxidation.

D. Polysaccharides, which would actually be a better energy storage form, would dissolve in the body.

The correct answer is C.

Kaplan explains why: Triacylglycerols are highly hydrophobic and therefore not highly hydrated (which would add extra weight from the water of hydration, taking away from the energy density of these molecules), eliminating choice A. The fatty acid chains produce twice as much energy as polysaccharides during oxidation because they are highly reduced. The fatty acid chains vary in length and saturation.

Section: Chemical and physical foundations of biological systems

Question: Which of the following is least likely to cause denaturation of proteins?
A. Heating the protein to 100 °C.
B. Adding 8 M urea.
C. Moving it to a more hypotonic environment.
D. Adding a detergent such as sodium dodecyl sulfate.

The correct answer is C.

Kaplan explains why: High salt concentrations and detergents can denature a protein, as can high temperatures. But moving a protein to a hypotonic environment—that is, a lower solute concentration—should not lead to denaturation.

Section: Psychological, social and biological foundations of behavior
Question: Humans have evolved to notice patterns and shapes. A corporate logo uses five unconnected angles equally spaced in a circular fashion. When viewed, it appears to be a star. Which of the following is the logo artist using to create a complete pattern to viewers?

A. Bottom-up processing.
B. Top-down processing.
C. Gate theory.
D. Gestalt principles.

The correct answer is D.

Kaplan explains why: Gestalt principles are the basis for many optical illusions and include the tendency of people to see continuity even when lines are unconnected. Specifically, this logo appears to rely on the law of closure to create one complete star from five non-touching angles.