

July 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.

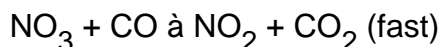
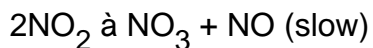
D. Polysaccharides, which would actually be a better energy storage form, would dissolve in the body.

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: Nitrogen dioxide (NO_2) is a toxic pollutant that has been implicated as a risk factor for Sudden Infant Death Syndrome. The following system obeys second-order kinetics:



What is the rate law for this reaction?

1. Rate = $k[\text{NO}_2][\text{CO}]$
2. Rate = $k[\text{NO}_2]^2[\text{CO}]$
3. Rate = $k[\text{NO}_2][\text{NO}_3]$
4. Rate = $k[\text{NO}_2]^2$

The correct answer is D.

Kaplan explains why: To answer this question, recall that the slow step of a reaction is the rate-determining step. The rate is always related to the concentrations of the reactants in the rate-determining step (not the overall reaction), so NO_2 is the only compound that should be included in the correct answer. The concentration of NO_2 is squared in the rate law because the stoichiometric coefficient of NO_2 in the rate-determining step is 2.

Section: Psychological, social and biological foundations of behavior

Question: Many pets will run toward the kitchen when they hear the sound of a can opener opening a can of pet food. The sound of the can opener is a:

- A. Conditioned response.
- B. Unconditioned response.
- C. Conditioned stimulus.
- D. Unconditioned stimulus.

The correct answer is C.

Kaplan explains why: The sound of a can opener would not normally produce a response on its own, making it a stimulus that must have been conditioned by association with the sound with food.