Medical College Admission Test (MCAT) Interview Questions And Answers Guide.

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Medical College Admission Test (MCAT) Job Interview Preparation Guide.

Question # 1

An object is placed upright on the axis of a thin convex lens at a distance of four focal lengths (4 f) from the center of the lens. An inverted image appears at a distance of 4/3 f on the other side of the lens. What is the ratio of the height of the image to the height of the object?

Answer:-

28.

1. 1/3
2. 3/4
3. 4/3
4. 3/1

Answer: A

Explanation: The ratio of object to image distance equals the ratio of object to image height. The ratio of image to object height is found by rearranging the ratios to give 4f /(4/3)f = 1/3. The image is demagnified by a factor of 3. Thus, answer choice A is the best answer.

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Question # 2

Which of the following must be known in order to determine the power output of an automobile?

Answer:-

1. Final velocity and height
2. Mass and amount of work performed
3. Force exerted and distance of motion
4. Work performed and elapsed time of work

Answer: D

Explanation: Power is defined as the rate of doing work. For the automobile, the power output is the amount of work done (overcoming friction) divided by the length of time in which the work was done. Therefore, answer choice D is the best answer

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Question # 3

Based on the passage, the mutation in the DNA in affected males from Family 2 most likely results in:

Answer:-

1. the replacement of a single amino acid in Protein R.
2. the replacement of a single amino acid in Protein P.
3. the introduction of a premature stop codon in Protein R.
4. the introduction of a premature stop codon in Hormone X.

Answer: B

Explanation: According to statement 5, Protein P from affected males from Family 2 could not be phosphorylated.This means that the genetic defect in Family 2 must be in the gene that codes for Protein P.Therefore, the correct answer choice is B, that the alteration of one amino acid in Protein P is the likely result of the mutation in the DNA of affected males.

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Question # 4

Evaporation occurs when molecules at the surface of a liquid overcome the attractive forces of the liquid.This occurs when molecules within the liquid attain a sufficient amount of:

Answer:-

1. resonance.
2. kinetic energy.
3. surface tension.
4. potential energy.

Answer: B

Explanation: Evaporation occurs when a molecule attains sufficient speed or kinetic energy to overcome the attractive forces of a liquid. Resonance, surface tension

and potential energy all relate to molecules that are not in motion. Thus, answer choice B is the best answer.

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Question # 5

When 47Be undergoes radioactive decay by electron capture (a form of ÃŸ+ decay), the resulting nucleus is:

Answer:-

1. 36Li
2. 37Li
3. 47Be
4. 48Be

Answer: B
Explanation: In radioactive decay, the sum of the mass numbers A and atomic numbers Z, before and after decay, must balance. The numbers for beryllium undergoing positron decay are: mass (7 = 7 + 0) and atomic (4 = 3 + 1). The resulting nucleus is 73Li. Thus, answer choice B is the best answer.

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Question # 6

Which of the following best explains why HCl bonds are polar covalent?

Answer:-

1. H atoms are smaller than Cl atoms.
2. H atoms are more electronegative than Cl atoms.
3. Cl and H atoms have equal electronegativities.
4. Cl atoms have a greater effective nuclear charge than H atoms do.

Answer: D

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Question # 7

How much work is done when a constant horizontal 20-N force pushes a 50-kg block a distance of 10 m on a horizontal surface?

Answer:-

How much work is done when a constant horizontal 20-N force pushes a 50-kg block a distance of 10 m on a horizontal surface?

1. 50 J
2. 100 J
3. 200 J
4. 500 J

Answer: C
Explanation: Work is the product of the force on an object and the distance the object moves in the direction of the applied force. In this case, work = 20 N x 10 m = 200 J. Thus, answer choice C is the best answer.

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Question # 8

Which of the following protein(s) is most likely to utilize ATP for its action?

Answer:-

1. Hormone X only
2. Protein R only
3. Protein P only
4. Both Hormone X and Protein P

Answer: B

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Question # 9

Which one of the following general characteristics is shared by all catalysts?

Answer:-

1. They induce more collisions among reactant molecules.
2. They transfer kinetic energy to the reactant molecules.
3. They increase the reaction rate but do not change the Keq of a reversible reaction.
4. They increase both the reaction rate and the Keq of a reversible reaction.

Answer: C
Explanation: In general, catalysts lower the activation energy of the slowest step in a reaction. Thus, they increase the rate of the reaction without increasing the number of collisions, the kinetic energy of the reactants, or the Keq of a reversible reaction. Thus, answer choice C is the best answer.

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Question # 10

A 15.0-eV photon collides with and ionizes a hydrogen atom. If the atom was originally in the ground state (ionization potential =13.6 eV), what is the kinetic energy of the ejected electron?

Answer:-

1. 1.4 eV
2. 13.6 eV
3. 15.0 eV
4. 28.6 eV

Answer:

Explanation: Conservation of energy requires that the 15.0 eV photon energy first provides the ionization energy to unbind the electron, and then allows any excess energy to become the electron's kinetic energy. The kinetic energy is this case is 15.0 eV-13.6 eV = 1.4 eV. Thus the correct answer is A.

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Question # 11

What is the work done by the force F? (Note: sin 60o = 0.87; cos 60o = 0.50. Ignore friction and the weights of the pulleys.)

Answer:-

1. 50 J
2. 100 J
3. 174 J
4. 200 J

Answer: D
Explanation: Work is the product of force and distance. The easiest way to calculate the work in this pulley problem is to multiply the net force on the weight mg by the distance it is raised: 4 kg x 10 m/s2 x 5 m = 200 J. Therefore, answer choice D is the best answer.

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