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Topic Break Down

Topic	No. of Questions
Topic 1, Biological Processes	83
Topic 2, Chemical Processes	78
Topic 3, Critical Reading	67
Topic 4, Quantitative Reasoning	64
Total	292

QUESTION NO: 1

Which of the following decompose disaccharides into monosaccharides?

A. salivary amylase

B. pancreatic enzymes

C. gastrin

D. brush border enzymes

ANSWER: D

Explanation:

Disaccharides such as sucrose, maltose, and lactose, etc., are broken down further into monosaccharides (primarily glucose) in the small intestine by way of brush border enzymes lining microvilli of the small intestine.

QUESTION NO: 2

What is the predominant source of progesterone after ovulation?

A. the oocyte

B. the ovary

C. the corpus callosum

D. the corpus luteum

ANSWER: D

Explanation:

Recall that the luteal phase of the menstrual cycle occurs after ovulation which occurs after the follicular phase. Progesterone saturation is highest during the luteal phase, and the corpus luteum is most responsible for this increased amount. The oocyte is an egg, which isn't responsible for progesterone. The ovary is a source of progesterone, but not the primary source. And the corpus callosum is the point of juncture between the hemispheres of the brain.

QUESTION NO: 3

Lead – non-biodegradable, soft, malleable, as well as heat and corrosion resistant – is environmentally omnipresent. Its known properties make it an ideal metal for automobiles, paint, smelting, ceramics, and plastics. Not many years ago, it was also utilized in the toy industry. Unfortunately, lead is toxic to humans. Humans neither need lead nor derive benefits from it. Although lead toxicity has been a global concern since the industrial revolution in the late 1800s, civilization has been unable

to prevent or control it satisfactorily. Overall incidence of lead poisoning among American children has fallen from 4.4% in the early 1990s to 1.4% in 2004. In 2002, around 10 out of every 100,000 of adults had lead toxicity. Venous blood lead levels (BLLs) of 10 mcg/dL and 25 mcg/dL were considered toxic in children and adults, respectively. But, since any level of lead can cause toxicity, the CDC announced a new, lower reference value for children in June 2012: 5 mcg/dL. Infants and children absorb a higher fraction of lead than adults do when exposed, increasing their vulnerability. Approximately 450,000 American children have BLLs >5 mcg/dL.

Consequently, lead poisoning is still a problem. Lead exposure can start with prenatal maternal-fetal transmission. Outside the womb, children may inhale (or eat) lead dust, often present in street debris, soil, and most frequently, aged house paint. Lead-based paint was phased out in the 1970s, lowering, but not eliminating, risk of exposure. Old pipes sometimes leach lead into drinking water. Lead hazards are disproportionately found in low-income housing. Adults rarely develop lead poisoning, but risk is increased for industrial workers who use or manufacture lead-based products. Health care providers use many tests to identify lead poisoning. In addition to the BLL, a blood smear may show basophilic stippling ribosomal clusters. Increased urinary aminolaevulinic acid concentrations are also reliable indicators. Plain film radiographs can reveal visible lead lines in patients' long bones. Astute clinicians sometimes diagnose lead poisoning after seeing a blue line along patients' gums (Burton's line) that forms when lead reacts with sulfur ions released by oral bacteria. Lead affects every organ system and causes an unpredictable variety of symptoms. The nervous system is most sensitive (centrally in children, peripherally in adults), but lead affects hematopoietic, hepatic, and renal systems, producing serious disorders. Acute lead poisoning's classic symptoms include colic, encephalopathy, anemia, neuropathy, and Fanconi syndrome (abnormal glucose, phosphates, and amino acid excretion). Sometimes, classic signs and symptoms are absent, confusing the clinical picture.

What is NOT a test to detect lead poisoning?

A. aminolaevulinic

B. blood smear

C. BLL

D. radiographs

ANSWER: A

Explanation:

This is not the name of a test or a method for detecting lead poisoning. It may be a word from the passage, but it does not answer the specific question posed. The other answer choices are all mentioned as tests for detecting lead poisoning.

QUESTION NO: 4

An electron pair donor is best classified as a:

A. strong acid

B. Bronsted-Lowry acid

C. Lewis acid

D. Lewis base

ANSWER: D

Explanation:

By definition, a Lewis base is an electron pair donor. A Lewis acid, on the other hand, is an electron pair acceptor.

QUESTION NO: 5

What effect would doubling the volume and temperature of an ideal gas have on its pressure?

A. double the pressure

B. half the pressure

C. make the pressure zero

D. no effect

ANSWER: D

Explanation:

The ideal gas law states: pV = NRT, where p is pressure, V is volume, N is the amount, R is the ideal gas constant, and T is the gas's temperature. Doubling the volume, V = 2V, and doubling the temperature, T = 2T, will have not alter the pressure because the 2's on both sides of the equation will cancel, yielding the original pressure.

QUESTION NO: 6

What results in extra or fewer chromosomes in a cell?

A. nondisjunction

B. double replication

C. double cytokinesis

D. epistasis

ANSWER: A

Explanation:

Nondisjunction is when chromosomes do NOT separate during anaphase. Consequently, the resulting cells display an unequal sharing of chromosomes, with some cells having too many, and others having too few.

QUESTION NO: 7

In which locations does this reaction occur?

Glyceraldehyde-3-phosphate (G3P) ———> Pyruvate

A. cytoplasm

B. nucleus

C. mitochondria

D. none of the above

ANSWER: A

Explanation:

The oxidation of G3P into pyruvate occurs during the glycolysis stage of cellular respiration. Glycolysis occurs in the cytoplasm.

QUESTION NO: 8

Since 1997, the American Heart Association (AHA) has attempted to increase awareness about cardiovascular disease (CVD) among women. Fortunately, great progress has been made to educate individuals about CVD and its consequences. According to the AHA's 2011 Guidelines for Prevention of Cardiovascular Disease in Women, the misconception that CVD is a "man's disease" has been somewhat disproved, as awareness among the general public increased from 30% in 1997 to 54% in 2009. Unfortunately, CVD continues to be the leading cause of death in the United States for both men and women. Since 1984, the number of deaths related to CVD in women exceeded those in men. In the United States, CVD death rates among women aged 35 to 54 years appear to be increasing by 1% annually, which is most likely attributable to the escalating obesity epidemic. According to the AHA, even though CVD is the number 1 cause of death among women, only 13% of women perceive CVD as a health threat. CVD is responsible for more deaths among women than the next 3 leading causes of death combined, including all forms of cancer. Due to the ongoing prevalence of CVD, increasing awareness and understanding of CVD, especially among the female population, is still a top priority for many health care professionals. As one of the most accessible health care professionals, pharmacists are in a pivotal position to educate and inform their patients of the risks associated with CVD, possible drug therapies, and preventive measures. The AHA has set a goal for 2020 to improve cardiovascular health in all Americans by 20%, while reducing deaths from CVD and stroke by 20%. According to the American Heart Association, in the United States a woman dies of some form of CVD every minute and more than 1 in 3 females have some form of CVD. Studies have demonstrated that gender differences may play an important role in the diagnosis, treatment, and prevention of CVD. Unfortunately, many women may not always recognize the warning signs and symptoms of a heart attack because they sometimes appear more subtle when compared with those typically experienced by men. Results from a study of 515 women who had heart attacks report that 43% did not experience any type of chest pain or pressure during the heart attack. Although the classic symptoms include chest pain, tingling in the left arm, sweating, and shortness of breath, women may also experience some "atypical" symptoms, such as extreme fatigue, nausea, dizziness, indigestion, vomiting, and pain in the neck or back. By learning and recognizing the warning signs, women can take a proactive approach to their cardiovascular health and get treatment earlier to prevent further complications.

Throughout the passage, it is implied that which of the following will lead to fewer deaths resulting from CVD?

A. Finding a cure for CVD.

B. Raising awareness and understanding of CVD.

C. Teaching women about the consequences of CVD.

D. Educating men and women about heart attacks.

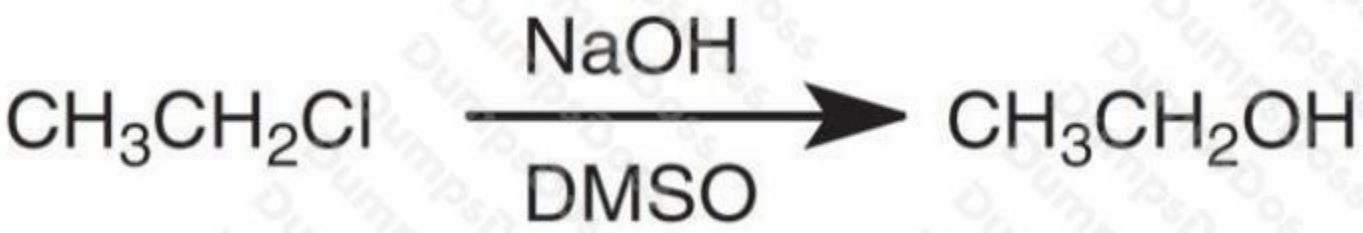
ANSWER: B

Explanation:

In the introductory paragraph, the author stresses the importance of raising awareness of CVD in the general public, presumably as a means of reducing the overall number of deaths resulting from CVD. This implication continues in the body paragraphs.

QUESTION NO: 9

Given the following reaction conditions, which statement is most accurate?



A. The reaction follows first-order kinetics and is a concerted reaction.

B. The reaction follows first-order kinetics and involves formation of a carbocation.

C. The reaction follows second-order kinetics and is concerted.

D. The reaction follows second-order kinetics and involves formation of a carbocation.

ANSWER: C

Explanation:

This substitution reaction shows chloride (Cl−) being replaced by hydroxide (OH−). Substitution reactions occur mainly via one of two mechanisms: SN1 (unimolecular kinetics and two steps with a carbocation intermediate) or SN2 (biomolecular kinetics and one step). In this situation, the mechanism isn't shown but can be inferred based on the reaction conditions. First, the reactant with the carbons (the substrate) has a strong leaving group; the Cl− that detaches is relatively stable as an ion in solution by itself (think of how table salt, NaCl, is able to readily dissolve into Na+ and Cl− in water). Second, the substrate has primary substitution, meaning the carbon attached to the leaving group is only attached to one other carbon, which in turn means that there is little steric hindrance but also that the carbon doesn't have many other carbons to stabilize it if it were to gain a charge. Third, the other reactant, OH−, is a strong base and strong nucleophile, indicating that it can readily attack the substrate on its own. Finally, the solvent DMSO (dimethyl sulfoxide) is polar aprotic so can stabilize the leaving group without deactivating the nucleophile. All of these factors point toward an SN2 reaction. Since an SN2 reactions is always concerted, occurring in one step without forming discrete intermediates.

QUESTION NO: 10

Which cells make up the insulated wrapping on axons?

A. Schwann cells

B. astrocytes

C. microglia

D. macrocytes

ANSWER: A

Explanation:

Axons are surrounded by insulating cells called Schwann cells. This insulation enables action potentials to travel rapidly throughout the nervous system.

QUESTION NO: 11

If a multivitamin supplement costs $n for 100 pills, how many pills can be bought for $10?

A. 10n

B. 1000n

C. 10/n

D. 1000/n

ANSWER: D

Explanation:

In this question, we can buy 100 pills for $n. We are asked to determine how many pills we can buy for $10. First, let's determine how many pills can be bought for $1: we can purchase 100/n. Therefore, $10 would buy 10 times 100/n or 1000/n. Therefore, we can purchase 1000/n for $10.

QUESTION NO: 12

When a population reaches its carrying capacity?

A. The population size begins to decrease.

B. The population growth rate approaches zero.

C. Other populations will be forced out of the habitat.

D. Density-independent factors no longer play a role.

E. Density-dependent factors no longer play a role.

ANSWER: B

Explanation:

Within a habitat, there is a maximum number of individuals that can continue to thrive, known as the habitat's carrying capacity. When the population size approaches this number, population growth will stop.

QUESTION NO: 13

If f(x) = 3x + 2, what is f−1(x) ?

A. 2x + 3

B. (x − 2) / 3

C. (3x − 2) / 3

D. −2/3

ANSWER: B

Explanation:

f(x) = y,

y = 3x + 2 x = 3y + 2 (replacing x an y variables) x − 2 = 3y y = f−1(x) = (x – 2) / 3

QUESTION NO: 14

Why does the lactic acid pathway predominate in anaerobic respiration?

A. because the lactic acid can be made into oxygen when needed

B. because O2 is needed for the creation of NADH

C. because O2 is required for glycolysis

D. without O2 there is no electron acceptor for the ETC

ANSWER: D

Explanation:

Lactic acid fermentation, a method of anaerobic respiration, is relied upon to generate energy for cells in the absence of oxygen. However, because oxygen acts as the primary electron acceptor in aerobic respiration, the lactic acid pathway, lacking oxygen, contains no electron acceptor in the process.

QUESTION NO: 15

In photosynthesis, high-energy electrons move through electron transport chains to produce ATP and NADPH. Which of the following provides the energy to create high energy electrons?

A. O2

B. Light

C. Water

D. NADP+

E. NADH

ANSWER: B

Explanation:

Electrons trapped by the chlorophyll P680 molecule in photosystem II are energized by light. They are then transferred to electron acceptors in an electron transport chain.

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