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Practice Questions

Try all 30 first, then check the answer key at the back.

1. Calculate the acceleration of a cyclist who increases their speed from 0 to 30 meters per second in 5 seconds.

A. 0.2 m/$$s^{2}$$
B. 6 m/h
C. 10 m/$$s^{2}$$
D. 6 m/$$s^{2}$$

2. A 700-g block of ice is initially at rest on a frictionless surface. A 70-g steel ball traveling at 4 m/sec strikes the block of ice and bounces backward at 1.5 m/sec. How fast will the block of ice be moving after the collision?

A. 2.5 m/sec
B. 1.82 m/sec
C. 0.35 m/sec
D. 0.07 m/sec

3. A chemical compound contains 20 hydrogen atoms and has a molecular mass of 34 amu. What is the molecular formula of this compound?

A. $$H_{20}$$
B. $$O{2}$$
C. $$N_{2}$$
D. $$C{12}H{22}O{11}$$

4. Which of the stages listed below denotes the final stage of the cell cycle in eukaryotic cells?

A. G1 phase
B. S phase
C. G2 phase
D. Cytokinesis

5. What type of tissue is primarily responsible for coordinating body movements and producing force?

A. Epithelial
B. Muscle
C. Nervous
D. Connective

6. To which bodily system do the kidneys and urinary bladder belong?

A. Digestive system
B. Respiratory system
C. Endocrine system
D. Urinary system

7. A nurse measures the pulse rate of a patient and records 72 beats per minute over a period of 15 minutes. What is the total number of heartbeats during this period?

A. 360 beats
B. 1080 beats
C. 1440 beats
D. 720 beats

8. According to Mendel's First Law, what is the outcome of a cross between two pea plants with differing alleles for flower color?

A. Different alleles for two genes
B. Equivalent alleles for one gene
C. Equivalent alleles for two genes
D. Different alleles for one gene

9. A nurse is pushing a medical cart that has a mass of 80 kg down a hallway. Two forces are acting on the cart: one is pushing it forward with a force of 60 N, and the other is pushing it backward with a force of 40 N. What is the magnitude of the cart's acceleration?

A. 1.25 m/sec^2
B. 0.5 m/sec^2
C. 0.25 m/sec^2
D. 2 m/sec^2

10. Which body system is primarily responsible for producing hormones that regulate metabolism, growth, and development?

A. Endocrine system
B. Muscular system
C. Respiratory system
D. Digestive system

11. Which of the following digestive system organs is primarily responsible for the absorption of nutrients during digestion?

A. Liver
B. Small intestine
C. Stomach
D. Large intestine

12. The force that opposes the flow of current through a conductor is known as electrical resistance. What is electrical resistance expressed in?

A. Ohms
B. Joules
C. Amperes
D. Newtons

13. A biology student observed a plant tissue sample under a microscope. The cells in the sample were elongated with tapering ends and a thick secondary cell wall. Which of the following best describes the type of cell the student was observing?

A. Collenchyma
B. Meristematic
C. Sclerenchyma
D. Parenchyma

14. View the details to answer the following question. What can be logically inferred from this details?

A. Claire's workplace is near her home.
B. Claire's lifestyle is affected by her work schedule.
C. Claire enjoys working night shifts more than day shifts.
D. Claire works more efficiently due to her night shifts.

15. Refer to the following details to answer the question below. Which of the following words best defines the term cogent?

A. Disorganized
B. Unclear
C. Convincing
D. Ambiguous

16. If during a patient assessment you discover an inconsistency in the recorded vital signs, what should you do?

A. Reassess the patient
B. Delete the records
C. Ignore the inconsistency
D. Add more information

17. “Evelyn quickly ran across the field.” In this sentence, what part of speech is the word ran?

A. Pronoun
B. Adjective
C. Verb
D. Noun

18. The team was proud of having completed all of its assignments. The adjective all modifies which of the following words in the given sentence?

A. assignments
B. team
C. proud
D. its

19. Refer to the details provided to answer the following question. Which of the following age groups is most likely to be diagnosed with rheumatoid arthritis?

A. 20-30
B. 30-40
C. 60-70
D. 40-60

20. Read the following sentence and select the meaning of the italicized word. The patient's blurred vision was due to a __neuro-ophthalmic__ condition, which required specialized care.

A. Relating to the nervous system and eyes
B. Relating to the digestive system
C. Relating to the cardiovascular system
D. Relating to the respiratory system

21. The Amazon River flows from Peru to Brazil in South America. What is the subject of the above sentence?

A. South America
B. Peru
C. Brazil
D. Amazon River

22. Review the details to answer the following question. Based on the context clues, what does the word nurturing mean in this description?

A. Indifferent
B. Aggressive
C. Detached
D. Caring

23. Convert the fraction $$\frac{1}{5}$$ into a percentage.

A. 50%
B. 0.2%
C. 20%
D. 2%

24. A hospital employed 200 nurses. Out of these, 70 were on the night shift and the rest were on the day shift. What is the ratio of nurses on the night shift to nurses on the day shift?

A. $$3:7$$
B. $$7:13$$
C. $$1:2$$
D. $$2:5$$

25. Calculate: 8 - $$\frac{9}{3}$$

A. 5
B. 6
C. 3
D. 7

26. Solve for z: $$2x + z = 16$$ $$z - x = 8$$

A. 10
B. 14
C. 8
D. $$\frac{32}{3}$$

27. Determine the value of $$x$$ in the equation below: $$\frac{x}{3} + \frac{1}{6} = \frac{5}{12} - \frac{2x}{3}$$

A. $$x = \frac{1}{3}$$
B. $$x = \frac{1}{4}$$
C. $$x = \frac{5}{18}$$
D. $$x = \frac{1}{8}$$

28. An electric car charges at a constant rate of 22 kilowatts per hour. If the battery capacity is 440 kilowatt-hours, how many hours will it take to fully charge the battery starting from empty?

A. 10 hours
B. 30 hours
C. 20 hours
D. 25 hours

29. A car travels at a constant speed of 60 miles per hour. If the driver starts driving at 2:00 p.m., which of the following is the best estimate of when the car will have traveled 150 miles?

A. 4:00 p.m.
B. 4:30 p.m.
C. 3:20 p.m.
D. 5:00 p.m.

30. Convert the fraction $$\frac{15}{500}$$ to a percentage.

A. 30%
B. 300%
C. 3%
D. 0.03%

Answer Key & Explanations

1. D — 6 m/$$s^{2}$$
The correct answer is 6 m/$$s^{2}$$. To find the acceleration, use the formula: $$\text{acceleration} = \frac{\text{change in velocity}}{\text{time taken}}$$. The change in velocity is calculated as: 30 m/s - 0 m/s = 30 m/s. The time taken is given as 5 seconds. Thus, $$\text{acceleration} = \frac{30\text{ m/s}}{5\text{ s}} = 6\text{ m/s}^2$$.

2. C — 0.35 m/sec
Answer: 0.35 m/sec. Use the conservation of momentum equation to solve for the speed of the block of ice. $$m_1v_1 + m_2v_2 = m_1v_1' + m_2v_2'$$ Where: $$m_1$$ is the mass of the steel ball, $$v_1$$ is the initial velocity of the steel ball, $$v_2$$ is the initial velocity of the block of ice (which is 0), $$v_1'$$ is the final velocity of the steel ball, and $$v_2'$$ is the final velocity of the block of ice. $$m_1 = 70 \text{ g}, \ v_1 = 4 \text{ m/sec}, \ v_2 = 0 \text{ m/sec}, \ v_1' = -1.5 \text{ m/sec}$$ Solving for $$v_2'$$, we get: $$v_2' = \frac{(70 \text{ g} \times 4 \text{ m/sec}) + (700 \text{ g} \times 0 \text{ m/sec}) - (70 \text{ g} \times -1.5 \text{ m/sec})}{700 \text{ g}} = 0.35 \text{ m/sec}$$

3. A — $$H_{20}$$
Answer: $$H_{20}$$ The molecular formula represents the number of atoms of each element in a molecule. Here, the compound is composed entirely of hydrogen atoms (20 atoms).

4. D — Cytokinesis
Cytokinesis is the final stage of the cell cycle in eukaryotic cells. During cytokinesis, the cytoplasm of a eukaryotic cell divides to form two daughter cells, each containing one nucleus. G1 phase is the first stage in the cell cycle, where the cell grows and synthesizes proteins necessary for cell division. S phase is the part of the cell cycle in which DNA is replicated. G2 phase follows DNA replication; the cell continues to grow and prepares for mitosis.

5. B — Muscle
Answer: Muscle Muscle tissue is specialized for contraction and movement. It is responsible for generating force and facilitating movement in the body. Muscle tissue is found in skeletal muscles, the heart, and the walls of hollow organs like the intestines and blood vessels.

6. D — Urinary system
Answer: Urinary system The urinary system, also known as the renal system, is responsible for the removal of waste products and excess substances from the bloodstream. This regulation is crucial to maintaining homeostasis. The urinary system includes the kidneys, ureters, urinary bladder, and urethra.

7. B — 1080 beats
To find the total number of heartbeats, multiply the pulse rate by the time period in minutes. Total number of heartbeats = Pulse rate $$\times$$ Time period Since the pulse rate is 72 beats per minute and the time period is 15 minutes: Total number of heartbeats = $$72 \times 15$$ Total number of heartbeats = 1080 beats

8. D — Different alleles for one gene
Mendel's First Law, also known as the Law of Segregation or monohybrid inheritance, states that the cross between two pea plants with differing alleles for a single trait (such as flower color) results in offspring with different alleles for that single gene. This law does not apply to crosses involving two traits (genes) or those with equivalent alleles.

9. C — 0.25 m/sec^2
Answer: 0.25 m/sec^2 To find the cart's acceleration, start by calculating the net force acting on it. Net force = Forward force - Backward force Net force = 60 N - 40 N Net force = 20 N Next, use Newton's second law equation to determine the acceleration: $$\text{Force} = \text{mass} \times \text{acceleration}$$ 20 N = 80 kg \(\times\) Acceleration Acceleration = $$\frac{20}{80}$$ m/sec^2 Acceleration = 0.25 m/sec^2

10. A — Endocrine system
The correct answer is the Endocrine system. The endocrine system includes glands such as the pituitary, thyroid, and adrenal glands that secrete hormones directly into the blood. These hormones regulate various functions in the body, including metabolism, growth, and sexual development.

11. B — Small intestine
Answer: Small intestine The digestive system includes organs specialized in breaking down food, absorbing nutrients, and expelling waste. The principal organs are the mouth, esophagus, stomach, small intestine, large intestine, liver, pancreas, and gallbladder. The small intestine is responsible for the absorption of most nutrients derived from digested food. It has three sections: the duodenum, jejunum, and ileum. The walls of the small intestine contain villi that help increase the surface area for nutrient absorption. The stomach aids in breaking down food through mechanical and chemical digestion. The large intestine absorbs water and electrolytes, forming and excreting solid waste. The liver produces bile, which helps digest fats but is not directly involved in nutrient absorption.

12. A — Ohms
Answer: Ohms. Electrical resistance is expressed in ohms. Ohms can be denoted by the symbol $$\Omega$$. Kinetic energy is expressed in joules, electric current is measured in amperes, and force is expressed in newtons.

13. C — Sclerenchyma
Answer: Sclerenchyma Sclerenchyma cells are elongated with tapering ends and possess thick secondary cell walls. Parenchyma cells are relatively unspecialized and have thin primary cell walls. Collenchyma cells have unevenly thickened primary walls and provide support. Meristematic cells are undifferentiated and are involved in plant growth.

14. B — Claire's lifestyle is affected by her work schedule.
Answer: Claire's lifestyle is affected by her work schedule. A logical conclusion or inference is based on the evidence provided. According to the details, Claire works night shifts and sleeps during the daytime, indicating her lifestyle is affected by her work schedule. The other statements may or may not be true but cannot be directly inferred from the provided information.

15. C — Convincing
Answer: Convincing A cogent argument is one that is clear, logical, and convincing. The context indicates that the student's argument left no room for doubt, meaning it was convincing.

16. A — Reassess the patient
Answer: Reassess the patient. If during a patient assessment you discover an inconsistency in the recorded vital signs, you should reassess the patient to verify the accuracy of the information. Vital signs should be accurate to ensure proper diagnosis and treatment. You should delete records only if they are incorrect and cannot be corrected. Ignoring inconsistencies can lead to improper treatment, while adding more information without reassessment can lead to further confusion.

17. C — Verb
Answer: Verb A verb is a word that describes an action or state of being. Ran is the word used to describe the sentence's action. Evelyn is a noun, and it's a proper noun because it names a specific person and begins with a capital letter. There are no pronouns in this sentence, so that choice can be eliminated. An adjective describes or modifies a noun; quickly is an adverb describing how Evelyn ran, not a noun.

18. A — assignments
Answer: assignments The adjective all modifies the noun assignments in the given sentence. A modifier helps describe another word. An adjective is a word that modifies a noun or pronoun; therefore, the adjective all would need to modify a noun or pronoun. In this case, the adjective all is describing the team's assignments. The adjective all does not modify the words: team, proud, or its.

19. D — 40-60
Answer: 40-60 The second paragraph explains that rheumatoid arthritis most commonly affects individuals between the ages of 40 and 60. Thus, the age group that is most likely to be diagnosed with rheumatoid arthritis is 40-60.

20. A — Relating to the nervous system and eyes
Answer: Relating to the nervous system and eyes The term "neuro-ophthalmic" means relating to both the nervous system and the eyes. Conditions under this category often require specialized care in neurology and ophthalmology. The term "digestive system" refers to the organs responsible for digestion. The term "cardiovascular system" pertains to the heart and blood vessels. The term "respiratory system" is related to the organs involved in breathing.

21. D — Amazon River
Answer: Amazon River The given sentence’s subject is “Amazon River.” A sentence’s subject is the principal noun that is doing or being. The other three options are nouns; however, their use is based on the principal noun: Amazon River.

22. D — Caring
Answer: Caring Nurturing means caring or providing care and support. The context clues are that the text emphasizes the emotional and physical support nurses provide, indicative of a caring attitude.

23. C — 20%
Answer: 20% A fraction can be converted to a percent by dividing the numerator by the denominator, multiplying by 100, and adding a percent sign. For $$\frac{1}{5}$$: $$\frac{1}{5} \times 100 = 20%$$

24. B — $$7:13$$
Answer: $$7:13$$ There were 200 nurses in all. Of these, 70 were on the night shift, so subtract this amount from the total number to find out how many were on the day shift. $$200 - 70 = 130$$ The ratio of nurses on the night shift to nurses on the day shift is $$70:130$$, or $$70/130$$. Simplify the fraction by dividing the

numerator and denominator by 10. $$\frac{70}{130} \div \frac{10}{10} = \frac{7}{13}$$

25. A — 5
Correct answer: 5 PEMDAS (parentheses, exponents, multiplication, division, addition, subtraction) dictates the order of operations. Division should be performed before subtraction. 8 - $$\frac{9}{3}$$ 8 - 3 = 5

26. D — $$\frac{32}{3}$$
Answer: $$\frac{32}{3}$$ Use substitution to solve the system of linear equations. Substitute $$x = z - 8$$ into the first equation and solve for z. $$2(z - 8) + z = 16$$ $$2z - 16 + z = 16$$ $$3z - 16 = 16$$ $$3z = 32$$ $$z = \frac{32}{3}$$

27. B — $$x = \frac{1}{4}$$
Answer: $$x = \frac{1}{4}$$ $$\frac{x}{3} + \frac{1}{6} = \frac{5}{12} - \frac{2x}{3}$$ The common denominator in this equation is 12, so convert all fractions. $$\left(\frac{x}{3} \times \frac{4}{4}\right) + \left(\frac{1}{6} \times \frac{2}{2}\right) = \frac{5}{12} - \left(\frac{2x}{3} \times \frac{4}{4}\right)$$ $$\frac{4x}{12} + \frac{2}{12} = \frac{5}{12} - \frac{8x}{12}$$ Rearrange to group common terms. $$\frac{4x}{12} + \frac{8x}{12} = \frac{5}{12} - \frac{2}{12}$$ Solve the equation $$\frac{12x}{12} = \frac{3}{12}$$ $$x = \frac{1}{4}$$

28. C — 20 hours
Answer: 20 hours First, find the total number of hours it will take to charge the battery to 440 kilowatt-hours. $$\frac{22 \text{ kilowatts}}{1 \text{ hour}} = \frac{440 \text{ kilowatt-hours}}{x \text{ hours}}$$ $$22 = \frac{440}{x}$$ $$22x = 440$$ $$x = 20 \text{ hours}$$

29. B — 4:30 p.m.
Set up a proportion to find out how many hours it will take to travel 150 miles at 60 miles per hour. $$\frac{60\ \text{miles}}{1\ \text{hour}} = \frac{150\ \text{miles}}{x\ \text{hours}}$$ $$60x = 150$$ $$x = 2.5\ \text{hours} = 2\ \text{hours} + 30\ \text{minutes}$$ Add 2.5 hours to 2:00 p.m. to get 4:30 p.m. Of all the answer choices, 4:30 p.m. is the closest option.

30. C — 3%
The correct answer is 3%. To convert a fraction to a percentage, divide the numerator by the denominator, multiply the result by 100, and add a percent sign. $$\frac{15}{500} = 0.03$$ $$0.03 \times 100 = 3\%$$

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