Theme Test

Visual Theme Comparison

Styling Demo

SET

Questions: **0**
Duration: **45min**

Physics

This section covers fundamental concepts in Physics including electricity, optics, and mechanics.

1. *If a 6V potential difference creates a 2A current in a resistor, what is its resistance?*

A. 12 Ω
B. 3 Ω
C. 0.33 Ω
D. 8 Ω

2. *A light ray hits a mirror at a 30° angle to the surface. What is the angle of reflection?*

A. 30°
B. 60°
C. 90°
D. 120°

3. *Evaluate the statement: 'The acceleration due to gravity (g) is constant everywhere on Earth.'*

A. True
B. False
C. True at the equator
D. True at the poles

4. *Which of these can form a real, inverted image?*

i. Convex lens
ii. Concave lens
iii. Plane mirror
iv. Convex mirror

A. i only
B. ii and iv
C. i and iii
D. All of the above

5. *How many of the following pairs are correctly matched?*

A. Electric Current - Ampere
B. Power - Watt
C. Resistance - Ohm
D. Force - Newton

A. 1 correct
B. 2 correct
C. 3 correct
D. All 4 correct

6. *Analyze the following assertion and reason.*

Assertion (A):
Magnetic field lines never intersect.

Reason (R):
An intersection would imply two field directions at one point, which is impossible.

A. A and R are true; R explains A
B. A and R are true; R does not explain A
C. A is true; R is false
D. A is false; R is true

7. *What is the correct order to find the total resistance of resistors in series?*

A. Sum the resistances.
B. Identify all series resistors.
C. The sum is the total resistance.

A. A → B → C
B. B → C → A
C. B → A → C
D. C → A → B

8. *According to the passage, what is a major challenge of solar and wind power?*

Renewable energy sources, such as solar and wind power, are crucial for combating climate change. They harness natural processes to generate electricity with minimal greenhouse gas emissions. Solar panels convert sunlight directly into electricity, while wind turbines use wind to spin a generator. Unlike fossil fuels, they are inexhaustible. However, their primary drawback is intermittency; solar power is only available during the day and wind power depends on variable weather conditions, making energy storage solutions essential for a reliable supply.

A. High emissions
B. Exhaustible resources
C. Inconsistent availability
D. Complex conversion

9. *What is the SI unit of refractive index?*

A. m/s
B. Dioptre
C. No unit
D. Metre

10. *Analyze the following assertion and reason.*

Assertion (A):

The power of a convex lens is positive.

Reason (R):

A convex lens has a positive focal length.

A. A and R are true; R explains A
B. A and R are true; R does not explain A
C. A is true; R is false
D. A is false; R is true

Chemistry

This section tests knowledge of chemical reactions, acids and bases, metals, and the periodic table.

11. *What is the pH of a neutral solution like pure water?*

A. 0 **B.** 7
C. 14 **D.** 1

12. *What type of reaction is $CaCO_3 \rightarrow CaO + CO_2$?*

A. Combination **B.** Decomposition
C. Displacement **D.** Double displacement

13. *Is the statement 'All metals are solid at room temperature' true or false?*

A. True **B.** False
C. True, except for gold
D. True, except for iron

14. *Which of the following are properties of acids?*

i. Sour taste
ii. Turns blue litmus red
iii. Feels slippery
iv. Reacts with metals to make H_2

A. i, ii, iii **B.** i, ii, iv
C. ii, iii **D.** All of the above

15. *Match the chemical name to its formula.*

1. Water - H_2SO_4
2. Table Salt - NaCl
3. Methane - CH_4
4. Sulfuric Acid - H_2O

A. 1-H_2O, 2-NaCl, 3-CH_4, 4-H_2SO_4
B. 1-NaCl, 2-H_2O, 3-CH_4, 4-H_2SO_4
C. 1-H_2O, 2-CH_4, 3-NaCl, 4-H_2SO_4
D. 1-H_2SO_4, 2-NaCl, 3-H_2O, 4-CH_4

16. *Analyze the following assertion and reason.*

Assertion (A):

In a redox reaction, oxidation and reduction occur simultaneously.

Reason (R):

Oxidation is electron loss and reduction is electron gain; electrons must be conserved.

A. A and R are true; R explains A
B. A and R are true; R does not explain A
C. A is true; R is false
D. A is false; R is true

17. *What is the correct order of steps to balance the equation: $Fe + H_2O \rightarrow Fe_3O_4 + H_2$?*

A. Balance H atoms.
B. Balance Fe atoms.
C. Balance O atoms.

A. A → C → B **B.** B → A → C
C. B → C → A **D.** C → B → A

18. *According to the passage, what was a key limitation of Mendeleev's periodic table?*

Dmitri Mendeleev's periodic table of 1869 was a monumental achievement in chemistry. He arranged the elements based on increasing atomic mass and grouped them by similar properties, even leaving gaps for undiscovered elements. However, his table had limitations. The primary issue was the placement of certain elements, like tellurium and iodine, where a heavier element had to be placed before a lighter one to maintain property alignment. Furthermore, the table could not explain the position of isotopes, which are atoms of the same element with different masses.

A. No noble gases
B. Couldn't place isotopes
C. Used atomic number
D. No gaps for new elements

19. *How are covalent bonds formed?*

A. Transferring electrons (metal to non-metal)
B. Sharing electrons (between non-metals)
C. Attraction between ions
D. Movement of free electrons

20. *Analyze the following assertion and reason.*

Assertion (A):

Iron rusts in moist air, forming a reddish-brown coat.

Reason (R):

Rusting is a redox reaction where iron is oxidized.

A. A and R are true; R explains A
B. A and R are true; R does not explain A
C. A is true; R is false
D. A is false; R is true

Biology

This section assesses understanding of life processes, heredity, and the human body.

21. *What are the final products of photosynthesis?*

A. CO_2, water, energy
B. Glucose, oxygen, water
C. Oxygen, CO_2
D. Glucose, CO_2

22. *Which heart chamber pumps oxygenated blood to the body?*

A. Right Atrium **B.** Right Ventricle
C. Left Atrium **D.** Left Ventricle

23. *Can acquired traits (e.g., muscle development) be inherited by offspring?*

A. True **B.** False
C. True for simple organisms
D. False for humans only

24. *Which are the three main parts of a neuron from this list?*

i. Dendrite
ii. Axon
iii. Cell Body
iv. Myelin

A. i, ii, iv **B.** i, iii, iv
C. ii, iii, iv **D.** i, ii, iii

25. *Match the gland to the hormone it produces.*

A. Pancreas - Thyroxine
B. Thyroid - Adrenaline
C. Adrenal - Growth Hormone
D. Pituitary - Insulin

A. A-Insulin, B-Thyroxine, C-Adrenaline, D-Growth Hormone
B. A-Thyroxine, B-Insulin, C-Growth Hormone, D-Adrenaline
C. A-Adrenaline, B-Growth Hormone, C-Insulin, D-Thyroxine
D. A-Insulin, B-Adrenaline, C-Thyroxine, D-Growth Hormone

26. *Analyze the following assertion and reason.*

Assertion (A):

Aerobic respiration yields more ATP than anaerobic.

Reason (R):

Aerobic respiration fully oxidizes glucose using oxygen.

A. A and R are true; R explains A
B. A and R are true; R does not explain A
C. A is true; R is false
D. A is false; R is true

27. *Arrange these organisms into a logical food chain.*

A. Lion
B. Grass
C. Deer

A. A → C → B **B.** B → C → A
C. C → A → B **D.** B → A → C

28. *According to the passage, what is the DNA base-pairing rule?*

Deoxyribonucleic acid, or DNA, is the molecule that carries the genetic instructions for all known living organisms. Its structure is a double helix, resembling a twisted ladder. The 'rungs' of this ladder are made of pairs of nitrogenous bases. There are four bases: Adenine (A), Guanine (G), Cytosine (C), and Thymine (T). A crucial feature of DNA's structure is the specific base-pairing rule: Adenine always pairs with Thymine, and Guanine always pairs with Cytosine. This complementarity is key to DNA replication and function.

A. A with G; C with T **B.** A with C; G with T
C. A with T; G with C
D. Any base with any base

29. *Hydra reproduces by developing outgrowths that detach. What is this called?*

A. Fission **B.** Fragmentation
C. Budding **D.** Spore formation

30. *Analyze the following assertion and reason.*

Assertion (A):
Kidneys filter waste from blood to form urine.

Reason (R):
Kidneys contain millions of filtering units called nephrons.

A. A and R are true; R explains A
B. A and R are true; R does not explain A
C. A is true; R is false
D. A is false; R is true

Mathematics

This section covers topics in algebra, geometry, trigonometry, and statistics.

31. *What is the discriminant formula for $ax^2 + bx + c = 0$?*

A. $b^2 + 4ac$ **B.** $b^2 - 4ac$
C. $4ac - b^2$ **D.** $-b \pm \sqrt{(b^2 - 4ac)}$

32. *What is the common difference of the AP: 4, 1, -2, -5, ...?*

A. 3 **B.** 4
C. -3 **D.** 5

33. *Is the statement 'sin(θ) can be 2' mathematically correct?*

A. Correct **B.** Incorrect
C. Correct if θ > 90°
D. Correct for right triangles

34. *Which of these statements about circles are true?*

i. A tangent is ⊥ to the radius at the point of tangency.
ii. Tangents from an external point are equal.
iii. A chord through the center is a diameter.
iv. A circle has multiple diameters.

A. i, ii **B.** i, ii, iii
C. ii, iv **D.** All are true

35. *Match the shape to its formula.*

1. Circle Area	-	s^3
2. Cube Volume	-	s^2
3. Square Area	-	$2\pi r$
4. Circle Circumference	-	πr^2

A. 1-πr^2, 2-s^3, 3-s^2, 4-$2\pi r$
B. 1-s^2, 2-s^3, 3-$2\pi r$, 4-πr^2
C. 1-πr^2, 2-s^2, 3-s^3, 4-$2\pi r$
D. 1-$2\pi r$, 2-s^3, 3-s^2, 4-πr^2

36. *Analyze the following assertion and reason.*

Assertion (A):
The probability of a sure event is 1.

Reason (R):
P(E) = (Favorable Outcomes) / (Total Outcomes).

A. A and R are true; R explains A
B. A and R are true; R does not explain A
C. A is true; R is false
D. A is false; R is true

37. *What is the correct order for the elimination method?*

A. Add/subtract equations to eliminate a variable.
B. Solve for the remaining variable.
C. Multiply to make coefficients of one variable equal.
D. Substitute the value to find the other variable.

A. C → A → B → D **B.** A → C → B → D
C. C → B → A → D **D.** B → D → C → A

38. *According to the passage, which measure is the 'middle value' of an ordered dataset?*

In statistics, measures of central tendency provide a summary of a dataset. The three most common measures are the mean, median, and mode. The mean is the arithmetic average, calculated by summing all values and dividing by the count of values. The mode is the value that appears most frequently in the dataset. The median is the value that separates the higher half from the lower half of a data sample; to find it, the data must first be arranged in ascending or descending order.

A. Mean **B.** Median
C. Mode **D.** Range

39. *What is the surface area formula for a sphere of radius 'r'?*

A. $(4/3)\pi r^3$ **B.** $2\pi r^2$

C. $4\pi r^2$ **D.** $\pi r^2 h$

40. *Analyze the following assertion and reason.*

Assertion (A):

The area ratio of similar triangles is the square of their side ratio.

Reason (R):

Similar triangles have equal angles and proportional sides.

A. A and R are true; R explains A

B. A and R are true; R does not explain A

C. A is true; R is false

D. A is false; R is true

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