

MHT CET 2026 Mathematics Answer Key PDF

Chemistry

1. **Option (c)** 12

Explanation:

In a face-centered cubic (FCC) crystal structure, each atom is in direct contact with 12 neighboring atoms (6 in its own plane, 3 in the plane above, and 3 in the plane below). Thus, its coordination number is 12.

2. **Option (c)** 2,4,6-Tribromophenol

Explanation:

When phenol reacts with highly polar bromine water, the strongly activating hydroxyl group facilitates electrophilic substitution at all available ortho and para positions. This results in the formation of a white precipitate of 2,4,6-tribromophenol.

3. **Option (b)** +5

Explanation:

Let the oxidation state of Phosphorus be x . Since Hydrogen is +1 and Oxygen is -2, the neutral compound equation is $3(+1) + x + 4(-2) = 0$, which solves to $x = +5$.

4. **Option (c)** Hydrogen

Explanation:

Sodium is a highly reactive alkali metal that reacts vigorously with the acidic hydrogen of the hydroxyl group in ethanol. This displacement reaction produces sodium ethoxide and releases hydrogen gas.

5. **Option (b)** $\text{S cm}^2 \text{ mol}^{-1}$

Explanation:

The standard SI unit for molar conductivity is $\text{S m}^2 \text{ mol}^{-1}$, but the commonly used unit in practical physical chemistry as presented in the choices is $\text{S cm}^2 \text{ mol}^{-1}$.

Physics

6. **Option (c)** It increases 4 times

Explanation:

The resistance of a wire is given by $R = \rho \frac{L}{\pi r^2}$. Assuming the length of the wire remains constant, halving the radius r reduces the cross-sectional area to one-fourth, causing the resistance to increase by a factor of 4.

7. **Option (c)** 11.2 km/s

Explanation:

The escape velocity of any body from the Earth's gravitational pull is given by $v_e = \sqrt{2gR_e}$. Substituting standard values for Earth's surface gravity and radius yields approximately 11.2 km/s.

8. **Option (c)** 1

Explanation:

In an AC circuit containing only a pure resistor, the alternating current and alternating voltage are completely in phase ($\phi = 0$). Consequently, the power factor, calculated as $\cos \phi$, is equal to 1.

9. **Option (c) Polarisation**

Explanation:

Polarisation restricts the vibrations of a wave to a single plane perpendicular to the direction of propagation. Since only transverse waves can have their vibrations restricted this way, polarisation uniquely confirms the transverse nature of light.

10. **Option (b) $E = h\nu$**

Explanation:

According to Planck's quantum theory, the energy carried by a single photon is directly proportional to its electromagnetic frequency. The constant of proportionality is Planck's constant h , yielding the relation $E = h\nu$.

Mathematics

11. **Option (a) $x \log x - x + C$**

Explanation:

Integrating $\log x$ by parts using $\int u dv = uv - \int v du$ with $u = \log x$ and $dv = dx$ gives $x \log x - \int x \cdot \frac{1}{x} dx$. This simplifies directly to the antiderivative $x \log x - x + C$.

12. **Option (c) $\pi/2$**

Explanation:

Using the standard inverse trigonometric identity, $\sin^{-1} x + \cos^{-1} x = \pi/2$ holds true for any $x \in [-1, 1]$. Alternatively, evaluating the terms directly gives $\pi/6 + \pi/3 = \pi/2$.

13. **Option (b) $-1/3$**

Explanation:

Differentiating the curve yields the tangent slope $y' = 4x + 3 \cos x$, which equals 3 at $x = 0$. The slope of the normal is the negative reciprocal of the tangent slope, giving $-1/3$.

14. **Option (b) 2**

Explanation:

The order of a differential equation is defined as the order of the highest derivative present in the equation. In this differential equation, the highest-order derivative is $\frac{d^2 y}{dx^2}$, which has an order of 2.

15. **Option (c) 0**

Explanation:

By definition, an impossible event is an event that cannot occur under any circumstances within the sample space. Since its favorable outcomes are empty, its probability of occurrence is exactly 0.