MHT CET 2026 Mathematics Answer key PDF

Chemistry

1. **Option (a)** 7.0×10^{-7}
Explanation: For a binary electrolyte BA, the relationship between solubility s and solubility product is $K_{sp} = s^2$. Solving for solubility gives $s = \sqrt{4.9 \times 10^{-13}} = \sqrt{49 \times 10^{-14}} = 7.0 \times 10^{-7}$ mol dm^{-3}.

2. **Option (d)** 1.7
Explanation: A strong dibasic acid dissociates completely to yield $[H^+] = 2C = 2 \times 0.01 = 0.02$ M. Taking the negative logarithm gives $pH = -\log(0.02) = 2 - \log 2 \approx 1.699 \approx 1.7$.

3. **Option (b)** 2×10^{-2}
Explanation: For $PbCl_2$, the solubility product is given by $K_{sp} = s(2s)^2 = 4s^3$. Solving $4s^3 = 3.2 \times 10^{-5}$ gives $s^3 = 8 \times 10^{-6} \implies s = 2 \times 10^{-2}$ mol dm^{-3}.

4. **Option (b)** $\mathbf{H_2O}_{(l)}$
Explanation: According to Brønsted–Lowry theory, HCl is $Acid_1$ and its conjugate partner Cl^- is $Base_1$. Water (H_2O) accepts a proton, acting as $Base_2$ to form conjugate $Acid_2$ (H_3O^+).

5. **Option (b)** 10
Explanation: The hydroxide ion concentration is $[OH^-] = C\alpha = 2 \times 10^{-3} \times 0.05 = 10^{-4}$ M, yielding $pOH = 4$. The pH of the solution is calculated as $pH = 14 - pOH = 14 - 4 = 10$.

Physics

6. **Option (a)** $\frac{5}{6}r$
Explanation: The equivalent resistance across the body-diagonal corners of a symmetrical cube skeleton consisting of twelve identical resistors each of resistance r is standardly given by $R_{eq} = \frac{5}{6}r$.

7. **Option (a) Attractive, magnitude** $\frac{\mu_0 eIv}{2\pi d}$
Explanation: The magnetic field is $B = \frac{\mu_0 I}{2\pi d}$. Applying the right-hand rule for $\vec{F} = e(\vec{v} \times \vec{B})$ shows the force on the positive proton points toward the wire (attractive) with magnitude $F = \frac{\mu_0 eIv}{2\pi d}$.

8. **Option (a)** 4 : 1
Explanation: Unwinding and rewinding to half the radius doubles the turns ($N' = 2N$). The magnetic field at the center of the coil is $B \propto N/R \implies B'/B = (N'/N) \times (R/R') = 2 \times 2 = 4 \implies 4 : 1$.

9. **Option (a)** $\pi e f r^2$
Explanation: The equivalent current of the revolving electron is $I = e/T = ef$, and the area of the orbit is $A = \pi r^2$. The magnetic dipole moment is therefore $M = IA = \pi e f r^2$.

10. **Option (b)** 8 **A**
Explanation: The efficiency is $\eta = \frac{V_s I_s}{V_p I_p}$. Substituting the given values: $0.80 = \frac{110 \times I_s}{220 \times 5} = \frac{110 I_s}{1100} \implies I_s = 8$ A.

Mathematics

11. **Option (b)** $\frac{1}{2}, \frac{-3}{4\sqrt{2}}$

Explanation: Substituting $u = \cos x$ into $I = \int \frac{\sin x(2-\cos^2 x)}{2\cos^2 x - 1} dx$ transforms it to $\int \frac{u^2-2}{2u^2-1} du = \frac{1}{2}u - \frac{3}{4\sqrt{2}} \log \left| \frac{\sqrt{2}u-1}{\sqrt{2}u+1} \right| + C$, giving $P = 1/2$ and $Q = -3/(4\sqrt{2})$.

12. **Option (b)** 2

Explanation: Since a, b, c are in AP, we have $a+c = 2b$. For an equilateral triangle ($A = B = C = 60°$, which is in AP), the expression evaluates to $\cos 60° + 2\cos 60° + \cos 60° = 0.5 + 1 + 0.5 = 2$.

13. **Option (d)** $\frac{8}{15}$

Explanation: The given area relation simplifies to $\frac{1}{2}ca \sin B = 2ca(1 - \cos B) \implies \sin B = 4(1 - \cos B)$. Using half-angle formulas, we get $\tan(B/2) = 1/4$, which yields $\tan B = \frac{2(1/4)}{1-1/16} = \frac{8}{15}$.

14. **Option (c)** 1

Explanation: Using the Cosine Rule, the third side is given by $c^2 = a^2 + b^2 - 2ab\cos C$. Substituting the given values yields $c^2 = 1 + 3 - 2\sqrt{3}\cos(\pi/6) = 4 - 3 = 1 \implies c = 1$.

15. **Option (c)** $\frac{4}{3}\left(\frac{x-1}{x+2}\right)^{1/4} + C$

Explanation: We rewrite the integrand as $\int \frac{1}{(x-1)^2}\left(\frac{x-1}{x+2}\right)^{5/4} dx$. Substituting $t = \frac{x-1}{x+2} \implies dt = \frac{3}{(x+2)^2}dx$ yields $\frac{1}{3}\int t^{-3/4} dt = \frac{4}{3}t^{1/4} + C = \frac{4}{3}\left(\frac{x-1}{x+2}\right)^{1/4} + C$.