

MHT CET 2026 Mathematics Answer Key PDF

Mathematics

1. Option (a) $x - 2 \log |x + 2| + C$

Explanation: By decomposing the integrand as $\frac{x}{x+2} = 1 - \frac{2}{x+2}$, we can perform integration term-by-term. Integrating both components with respect to x directly yields the expression $x - 2 \log |x + 2| + C$.

2. Option (c) Impossible for all $x \in \mathbb{R}$

Explanation: The derivative is $f'(x) = k \cos x - 2 \sin x = \sqrt{k^2 + 4} \cos(x + \theta)$, which periodically takes negative values. For the function to be increasing for all x , we require $f'(x) \geq 0$ for all x , which is mathematically impossible.

3. Option (b) 13

Explanation: Solving the separable differential equation gives $\log(y+5) = x+C$. Substituting $y(0) = 4$ yields $y(x) = 9e^x - 5$, so substituting $x = \log 2$ gives $y(\log 2) = 9(2) - 5 = 13$.

4. Option (b) (3, 3, 3)

Explanation: The parametric equation of the line is $x = y = z = \lambda + 1$. Substituting this into the plane's equation $x + y + z = 9$ yields $3(\lambda + 1) = 9 \implies \lambda = 2$, which gives the intersection point as (3, 3, 3).

Physics

5. Option (b) 20 metres

Explanation: Using the kinematic relation $v^2 = u^2 - 2gh$ with $v = 0$ at maximum height, the initial velocity $u = 20$ m/s, and $g = 10$ m/s² yields $0 = 400 - 20h \implies h = 20$ m.

6. Option (b) 3 : 1

Explanation: At $t = T/6$, the displacement is $x = A \sin(\pi/3) = \frac{\sqrt{3}}{2}A$. The ratio of potential to kinetic energy is given by $\frac{PE}{KE} = \frac{x^2}{A^2 - x^2} = \frac{3/4}{1/4} = 3 : 1$.

7. Option (b) 120 J

Explanation: The work done by an expanding gas against constant external pressure is $W = P\Delta V$. Substituting $P = 2 \times 10^5$ Pa and $\Delta V = 0.6 \times 10^{-3}$ m³ gives $W = 120$ J.

8. Option (c) 0.15 m

Explanation: The radius of the circular path of a charged particle in a magnetic field is $r = \frac{mv}{qB}$. Substituting the values of m, q for an electron along with the given v and B yields $r \approx 0.15$ m.

Chemistry

9. Option (b) Conc. HCl and anhydrous ZnCl₂

Explanation: The Lucas reagent consists of a mixture of concentrated hydrochloric acid and anhydrous zinc chloride. It distinguishes primary, secondary, and tertiary alcohols based on the distinct rate at which they form a turbid solution of alkyl chlorides.

10. Option (b) 1.26×10^{24}

Explanation: One mole of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) contains 6 moles of carbon atoms. Therefore, 0.35 moles of glucose contain $0.35 \times 6 = 2.10$ moles of carbon, which is equal to $2.10 \times 6.022 \times 10^{23} \approx 1.26 \times 10^{24}$ carbon atoms.

11. Option (c) sp, Linear

Explanation: In ethyne ($\text{HC} \equiv \text{CH}$), each carbon forms one triple bond and one single bond, corresponding to two σ -bonds and zero lone pairs. This steric number of 2 corresponds to a linear geometry with sp hybridization.

12. Option (b) 5.6 L

Explanation: The molecular mass of the gas is $2 \times \text{vapour density} = 32 \text{ g/mol}$, so 8 g of the gas corresponds to 0.25 moles. At STP, the volume occupied is $0.25 \times 22.4 \text{ L} = 5.6 \text{ L}$.

13. Option (c) Tertiary carbocation

Explanation: Carbocation stability is enhanced by electron-donating alkyl groups through hyperconjugation and inductive effects. This positive charge dispersal makes tertiary carbocations (3°) more stable than secondary (2°) and primary (1°) ones.

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