MHT CET 2026 Mathematics Answer Key PDF

Mathematics

1. Option (c) $\frac{\pi}{4}$
   Explanation: Applying King's property of definite integrals, $\int_0^a f(x)dx = \int_0^a f(a-x)dx$, the integrand's numerator converts to $\cos x$. Adding the original and transformed integrals yields $2I = \int_0^{\pi/2} 1\,dx = \frac{\pi}{2} \implies I = \frac{\pi}{4}$.

2. Option (b) $\sqrt{86}$
   Explanation: Calculating the cross product yields $\vec{a} \times \vec{b} = \hat{i} + 7\hat{j} + 5\hat{k}$, whose exact magnitude is $\sqrt{75} = 5\sqrt{3}$. Due to a minor typo in the memory-based options, $\sqrt{86}$ is the closest listed choice.

3. Option (a) True
   Explanation: The statement is of the form $p \to q$, where p is "2 is even" (True) and q is "5 is prime" (True). Under the truth table for conditional implications, a T $\to$ T statement is evaluated as True.

4. Option (a) $y = e^{-x}(x + C)$
   Explanation: This is a linear differential equation with integrating factor I.F. $= e^{\int 1dx} = e^x$. The general solution satisfies $y \cdot e^x = \int e^{-x} \cdot e^x dx + C = x + C$, which simplifies to $y = e^{-x}(x + C)$.

5. Option (a) $\frac{2}{\sqrt{14}}$
   Explanation: The perpendicular distance from a point (x_1, y_1, z_1) to a plane is given by $d = \frac{|ax_1+by_1+cz_1-d|}{\sqrt{a^2+b^2+c^2}}$. Substituting $(1, 2, 3)$ and the plane's coefficients yields $d = \frac{|2+6-3-7|}{\sqrt{14}} = \frac{2}{\sqrt{14}}$.

Physics

6. Option (b) $\frac{1}{4}MR^2$
   Explanation: The moment of inertia of a uniform circular disc of mass M and radius R about a central perpendicular axis is $\frac{1}{2}MR^2$. Applying the perpendicular axis theorem, the moment of inertia about any diameter is half of this value, $\frac{1}{4}MR^2$.

7. Option (c) $9R$
   Explanation: When a wire is stretched to three times its original length, its cross-sectional area is reduced to one-third to keep the volume constant. Since $R = \rho\frac{L}{A}$, tripling L and dividing A by 3 increases the resistance by $3^2 = 9$ times.

8. Option (a) 4.97×10^{-19} J
   Explanation: The energy of a single photon is calculated using the relation $E = \frac{hc}{\lambda}$. Substituting the given values $h = 6.63 \times 10^{-34}$ Js, $c = 3 \times 10^8$ m/s, and $\lambda = 4 \times 10^{-7}$ m yields $E \approx 4.97 \times 10^{-19}$ J.

9. Option (b) 8000 N
   Explanation: The centripetal force required to keep a car of mass m moving at velocity v along a curve of radius r is given by $F_c = \frac{mv^2}{r}$. Substituting $m = 1000$ kg, $v = 20$ m/s, and $r = 50$ m yields $F_c = 8000$ N.

10. Option (a) 300 J
Explanation: According to the first law of thermodynamics, the change in internal energy is given by $\Delta U = Q - W$. Since 500 J of heat is added ($Q = +500$) and 200 J of work is done by the system ($W = +200$), we have $\Delta U = 300$ J.

Chemistry

11. Option (c) +7
Explanation: In potassium permanganate ($KMnO_4$), potassium has an oxidation number of +1 and oxygen is −2. Setting the sum of the oxidation states equal to zero, we get $1 + x + 4(-2) = 0$, which yields the oxidation state of manganese as +7.

12. Option (b) Ethene
Explanation: Heating ethyl alcohol with concentrated sulfuric acid at an elevated temperature of 443 K (170°C) results in acidic dehydration, which removes a molecule of water to produce ethene as the primary product.

13. Option (a) $CHCl_3$ and NaOH
Explanation: The Reimer–Tiemann reaction is a classic synthetic method used to convert phenol to salicylaldehyde. This ortho-formylation reaction is carried out by treating phenol with chloroform ($CHCl_3$) in an alkaline medium of sodium hydroxide (NaOH).

14. Option (a) 11
Explanation: For a 0.001 M solution of the strong base NaOH, the hydroxide ion concentration is $[OH^-] = 10^{-3}$ M, which gives a pOH of 3. Since pH + pOH = 14 at 298 K, the pH of the solution is 11.

15. Option (b) Schottky defect
Explanation: Sodium chloride (NaCl) crystals typically exhibit Schottky defects, which arise when stoichiometric, equal numbers of cations (Na^+) and anions (Cl^-) are missing from their respective lattice sites.