

MHT CET 2026 Mathematics Answer Key PDF

Mathematics

- Option (a) $\frac{8}{3} \ln|x-4| - \frac{2}{3} \ln|x-1| + C$
 Explanation: Factoring the denominator of the integrand yields $(x-4)(x-1)$. Using partial fractions, we rewrite the integrand as $\frac{8/3}{x-4} - \frac{2/3}{x-1}$, and integrating these terms gives the correct logarithmic solution.
- Option (a) $y = 3x - 2$
 Explanation: At $x = 1$, the corresponding y -value on the curve is 1. Differentiating $y = 3x^3 - 3x^2 + 1$ gives the tangent slope $m = 3$ at $x = 1$, and the point-slope form yields the equation $y = 3x - 2$.
- Option (c) $x = \frac{2n\pi}{7}, 2n\pi$
 Explanation: Using the general trigonometric identity for cosine, the equation $\cos 4x = \cos 3x$ leads to $4x = 2n\pi \pm 3x$. Solving separately for the positive and negative signs yields the general solutions $x = 2n\pi$ and $x = \frac{2n\pi}{7}$.
- Option (a) $x - 2 \ln|x+2| + C$
 Explanation: Rewriting the integrand by adjusting the numerator as $\frac{x+2-2}{x+2} = 1 - \frac{2}{x+2}$ allows for direct term-by-term integration, which yields $x - 2 \ln|x+2| + C$.
- Option (b) $\frac{|\vec{AC}|b + |\vec{AB}|c}{|\vec{AB}| + |\vec{AC}|}$
 Explanation: By the angle bisector theorem, point D divides BC internally in the ratio $c : b$, where $c = |\vec{AB}|$ and $b = |\vec{AC}|$. Applying the section formula to this ratio gives the position vector in option (b).

Physics

- Option (b) 3
 Explanation: At time $t = T/6$, the displacement of the simple harmonic oscillator is $x = A \sin(\pi/3) = \frac{\sqrt{3}}{2}A$. The ratio of potential energy to kinetic energy is given by $\frac{x^2}{A^2 - x^2} = \frac{3/4}{1/4} = 3$.
- Option (b) 20%
 Explanation: By the Doppler effect, the apparent frequency heard by an observer moving toward a stationary source is $n' = n(1 + \frac{v_o}{v})$. For $v_o = v/5$, the frequency becomes $1.2n$, corresponding to a 20% increase.
- Option (c) $\frac{4}{3}$
 Explanation: The initial open-pipe frequency is $f_1 = \frac{v}{2L}$. Submerging $1/3$ of its length converts it to a closed pipe of length $\frac{2}{3}L$, whose fundamental frequency is $f_2 = \frac{3v}{8L}$, giving the ratio $f_1/f_2 = 4/3$.
- Option (b) 15 m/s
 Explanation: Using the first equation of motion $v = u + at$ for a car starting from rest ($u = 0$), with a constant acceleration of 3 m/s^2 , the velocity after 5 seconds is $3 \times 5 = 15 \text{ m/s}$.
- Option (b) 5 m/s^2
 Explanation: According to Newton's second law of motion, the acceleration of the block is given by $a = F/m$. Substituting the values $F = 10 \text{ N}$ and $m = 2 \text{ kg}$ yields $a = 5 \text{ m/s}^2$.

Chemistry

11. Option (b) $\text{CH}_2 = \text{CH}_2$

Explanation: Alkyl halides react with alcoholic KOH to undergo dehydrohalogenation, which is a β -elimination reaction. This process removes HBr from ethyl bromide to form ethene ($\text{CH}_2 = \text{CH}_2$).

12. Option (b) -1

Explanation: In peroxide compounds such as hydrogen peroxide (H_2O_2) or sodium peroxide (Na_2O_2), each oxygen atom forms a single covalent bond with another oxygen atom, resulting in an oxidation state of -1 .

13. Option (b) SbF_3

Explanation: The Swarts reaction is a classic organic method used for preparing alkyl fluorides. It involves heating alkyl chlorides or bromides in the presence of metallic fluorides such as antimony trifluoride (SbF_3).

14. Option (c) Cannizzaro reaction

Explanation: In the Cannizzaro reaction, an aldehyde without α -hydrogens undergoes self-oxidation and reduction in a concentrated alkaline medium, which represents a classic disproportionation process.

15. Option (b) Sodium alkoxide + Hydrogen gas

Explanation: Alcohols act as weak acids and react readily with active alkali metals like sodium, displacing the acidic hydrogen atom to release hydrogen gas and form the corresponding sodium alkoxide.