

MHT CET 2026 May 18 Shift 1

Question Paper (Memory Based)

Conducted by CET Cell, Maharashtra



General Instructions

- (i) **Duration:** The total duration of the examination is 3 hours (180 minutes).
- (ii) **Total Marks:** The complete paper carries a maximum of 200 marks.
- (iii) **Structure:** The paper has 3 Sections:
 - **Section A:** 50 Multiple Choice Questions (Physics).
 - **Section B:** 50 Multiple Choice Questions (Chemistry).
 - **Section B:** 50 Multiple Choice Questions (Mathematics).
- (iv) **Compulsory Questions:** All 150 questions are compulsory.
- (v) Each question has four options. Only **one** option is correct.
- (vi) **Correct Answer:** +1 marks.
- (vii) **Incorrect Answer:** (No Negative marking).
- (viii) **Unanswered/Marked for Review:** 0 marks.

1. If a polygon has 54 diagonals, find the number of sides of the polygon.

- (A) 10
- (B) 11
- (C) 12
- (D) 15

2. If $y = \cos^{-1} x$, find $\frac{d^2y}{dx^2}$ in terms of y .

- (A) $-\csc^2 y \cot y$
(B) $\csc^2 y \cot y$
(C) $-\csc y \cot^2 y$
(D) $\csc y \cot^2 y$
-

3. If $A = \begin{bmatrix} 4 & 5 \\ 2 & 1 \end{bmatrix}$, find A^{-1} .

- (A) $\begin{bmatrix} 1/6 & -5/6 \\ -1/3 & 2/3 \end{bmatrix}$
(B) $\begin{bmatrix} -1/6 & 5/6 \\ 1/3 & -2/3 \end{bmatrix}$
(C) $\begin{bmatrix} -1 & 5 \\ 2 & -4 \end{bmatrix}$
(D) $\begin{bmatrix} 4 & -5 \\ -2 & 1 \end{bmatrix}$
-

4. If $\int x^3 e^x dx = e^x(px^3 + qx^2 + rx + s) + C$, then find the value of $p + q + r + s$.

- (A) -2
(B) 0
(C) 1
(D) 6
-

5. Find the distance between the point $2\hat{i} + \hat{j} - \hat{k}$ and the plane $\vec{r} \cdot (\hat{i} - 2\hat{j} + 4\hat{k}) = 9$.

- (A) $\frac{13}{\sqrt{21}}$
(B) $\frac{9}{\sqrt{21}}$
(C) $\frac{13}{21}$
(D) $\frac{21}{\sqrt{13}}$
-

6. If the scalar triple product of three vectors $\vec{a}, \vec{b}, \vec{c}$ is given as $[\vec{a} \ \vec{b} \ \vec{c}] = 3$, then find the value of the scalar triple product of their cross products, denoted as $[\vec{a} \times \vec{b} \ \vec{b} \times \vec{c} \ \vec{c} \times \vec{a}]$.

- (A) 3
 - (B) 6
 - (C) 9
 - (D) 27
-

7. Evaluate the indefinite integral:

$$\int \frac{x^3 \sin[\tan^{-1}(x^4)]}{1 + x^8} dx$$

- (A) $\frac{1}{4} \cos[\tan^{-1}(x^4)] + C$
 - (B) $-\frac{1}{4} \cos[\tan^{-1}(x^4)] + C$
 - (C) $\frac{1}{4} \sin[\tan^{-1}(x^4)] + C$
 - (D) $-\frac{1}{4} \sin[\tan^{-1}(x^4)] + C$
-

8. If $A = \begin{bmatrix} 1 & -2 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}$, find the value of the matrix expression $A(I + \text{adj } A)$, where I is the identity matrix of the same order as A .

- (A) $\begin{bmatrix} 8 & -2 & 2 \\ 0 & 8 & -3 \\ 3 & -2 & 8 \end{bmatrix}$
- (B) $\begin{bmatrix} 9 & -2 & 2 \\ 0 & 10 & -3 \\ 3 & -2 & 12 \end{bmatrix}$
- (C) $\begin{bmatrix} 1 & -16 & 16 \\ 0 & 16 & -24 \\ 24 & -16 & 32 \end{bmatrix}$
- (D) $\begin{bmatrix} 9 & 0 & 0 \\ 0 & 10 & 0 \\ 0 & 0 & 12 \end{bmatrix}$

9. Evaluate the indefinite integral:

$$\int e^x(\sin x + \cos x) dx$$

- (A) $e^x \cos x + C$
 - (B) $e^x \sin x + C$
 - (C) $-e^x \sin x + C$
 - (D) $e^x(\sin x - \cos x) + C$
-

10. In $\triangle ABC$, if $\angle C = \frac{2\pi}{3}$, then the value of $\cos^2 A + \cos^2 B - \cos A \cos B$ is:

- (A) $\frac{1}{2}$
 - (B) $\frac{3}{4}$
 - (C) 1
 - (D) $\frac{3}{2}$
-

11. Which of the following compounds is NOT in the gaseous phase at 25°C ?

- (A) ClF
 - (B) BrF
 - (C) IF₃
 - (D) ClF₃
-

12. A solution is prepared by dissolving 2 g of a non-volatile solute in 500 mL of solution at 27°C . The osmotic pressure of the solution is 0.82 atm. The molar mass of the solute is:

- (A) 100 g mol^{-1}
 - (B) 120 g mol^{-1}
 - (C) 150 g mol^{-1}
 - (D) 180 g mol^{-1}
-

13. What is the oxidation state of sulfur in Marshall's acid ($\text{H}_2\text{S}_2\text{O}_8$)?

- (A) +4
 - (B) +5
 - (C) +6
 - (D) +7
-

14. Oil of wintergreen is chemically known as:

- (A) Methyl acetate
 - (B) Methyl salicylate
 - (C) Ethyl salicylate
 - (D) Salicylic acid
-

15. Which of the following does not belong to Group 16 elements?

- (A) Oxygen
 - (B) Sulfur
 - (C) Selenium
 - (D) Chlorine
-