

MHT CET 2026 May 20 Shift 2

Question Paper (Memory-Based)

Conducted by Maharashtra State CET Cell



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 C:** 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) **Right Answer:** +1 marks for Physics and Chemistry Questions. +2 marks for Mathematics Questions
- (vii) **Incorrect Answer:** (No Negative marking).
- (viii) **Unanswered/Marked for Review:** 0 marks.

1. Given $f(x) = x - 1$, $h(1) = 4$, and $h'(1) = -2$. If $g(x) = (f[4(h(x)) + 3])^2$, find the value of $g'(1)$.

- (A) -288
- (B) 288
- (C) -144
- (D) 144

2. The area in sq. units bounded by the curve $y = 2\sqrt{1-x^2}$ and the x-axis is :

- (A) π
 - (B) 2π
 - (C) $\pi/2$
 - (D) 4π
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3. The objective function is $Z = 3x + 5y$. The difference between the maximum and minimum values of Z is $3a$, subject to constraints: $x + y \geq 1$, $5x + 10y \leq 50$, $x, y \geq 0$. Find the value of a .

- (A) 3
 - (B) 6
 - (C) 9
 - (D) 27
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4. The surrounding temperature is 20°C . A body cools from 100°C to 60°C in 20 minutes. Find the time taken for the body to cool down to 30°C .

- (A) 40 minutes
 - (B) 50 minutes
 - (C) 60 minutes
 - (D) 80 minutes
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5. For the parabola $y^2 = 16x$, find the distance between the focus and the directrix.

- (A) 2
 - (B) 4
 - (C) 8
 - (D) 16
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6. The lines $\vec{r} \times \vec{a} = \vec{b} \times \vec{a}$ and $\vec{r} \times \vec{b} = \vec{a} \times \vec{b}$ intersect at a point, where $\vec{a} = \hat{i} + \hat{j}$ and $\vec{b} = \hat{i} - \hat{k}$. Find the point of intersection.

- (A) $(2, 1, -1)$
- (B) $(1, 1, -1)$
- (C) $(2, 0, -1)$
- (D) $(1, 0, -1)$

7. The statement $\neg(p \leftrightarrow q)$ is logically equivalent to:

- (A) $\neg p \leftrightarrow \neg q$
 - (B) $\neg p \rightarrow q$
 - (C) $\neg(p \rightarrow \neg q)$
 - (D) $p \leftrightarrow \neg q$
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8. If $A = \begin{bmatrix} \sec \theta & -\tan \theta \\ -\tan \theta & \sec \theta \end{bmatrix}$ and $A + \text{adj}A = 4I$, then find the value of θ .

- (A) $\frac{\pi}{6}$
 - (B) $\frac{\pi}{4}$
 - (C) 0
 - (D) $\frac{\pi}{3}$
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9. Let $f(x) = \sqrt{x^2 + 1}$, $g(x) = \frac{x+1}{x^2+1}$, $h(x) = 2x - 3$. Then, $f'(h'(g'(x))) = ?$

- (A) $\frac{2}{\sqrt{5}}$
 - (B) $\frac{-2}{\sqrt{5}}$
 - (C) 0
 - (D) $\frac{1}{\sqrt{5}}$
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10. Evaluate:

$$\int \frac{x+1}{x(1+xe^x)^2} dx$$

(A)

$$\ln \left| \frac{xe^x}{1+xe^x} \right| + \frac{1}{1+xe^x} + C$$

(B)

$$\ln |xe^x| - \ln |1+xe^x| - \frac{1}{1+xe^x} + C$$

(C)

$$\ln \left| \frac{1 + xe^x}{xe^x} \right| + \frac{1}{1 + xe^x} + C$$

(D)

$$\frac{1}{1 + xe^x} + C$$
