

# MHT CET 2026 April 14 Shift 1

## Question Paper

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 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.
- (vii) **Incorrect Answer:** (No Negative marking).
- (viii) **Unanswered/Marked for Review:** 0 marks.

### Mathematics

1. Evaluate the integral:

$$\int \frac{2x}{x^2 - 5x + 4} dx$$

- (A)  $\frac{8}{3} \ln|x - 4| - \frac{2}{3} \ln|x - 1| + C$
- (B)  $\frac{2}{3} \ln|x - 1| - \frac{8}{3} \ln|x - 4| + C$
- (C)  $2 \ln|x - 1| + \ln|x - 4| + C$
- (D)  $\ln|x^2 - 5x + 4| + C$

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2. For the curve  $y = 3x^3 - 3x^2 + 1$  at  $x = 1$ , find the equation of the tangent.

- (A)  $y = 3x - 2$
  - (B)  $y = 3x - 3$
  - (C)  $y = 3x - 1$
  - (D)  $y = x + 1$
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3. Find the general solution for  $x$  if  $\cos 4x = \cos 3x$ .

- (A)  $x = 2n\pi$
  - (B)  $x = \frac{2n\pi}{7}$
  - (C)  $x = \frac{2n\pi}{7}, 2n\pi$
  - (D)  $x = \frac{n\pi}{7}$
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4. Evaluate the integral:

$$\int \frac{x}{x+2} dx$$

- (A)  $x - 2 \ln|x+2| + C$
  - (B)  $x + 2 \ln|x+2| + C$
  - (C)  $x - \ln|x+2| + C$
  - (D)  $\ln|x+2| + C$
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5. If  $A, B, C$  are vertices of a triangle with position vectors  $\vec{a}, \vec{b}, \vec{c}$ , find the position vector of the point  $D$  where the angle bisector from vertex  $A$  meets  $BC$ .

- (A)  $\frac{\vec{b} + \vec{c}}{2}$
  - (B)  $\frac{|\vec{AC}| \vec{b} + |\vec{AB}| \vec{c}}{|\vec{AB}| + |\vec{AC}|}$
  - (C)  $\frac{|\vec{AB}| \vec{b} + |\vec{AC}| \vec{c}}{|\vec{AB}| + |\vec{AC}|}$
  - (D)  $\frac{\vec{a} + \vec{b} + \vec{c}}{3}$
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## Physics

6. A particle starts oscillating simple harmonically from its mean position with time period  $T$ ; find the ratio of potential energy to kinetic energy at time  $t = \frac{T}{6}$ .

- (A)  $\frac{1}{3}$
  - (B) 3
  - (C)  $\frac{1}{2}$
  - (D) 1
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7. Calculate the percentage increase in apparent frequency for an observer moving towards a stationary sound source with  $\frac{1}{5}$ th the velocity of sound.

- (A) 10%
  - (B) 20%
  - (C) 25%
  - (D) 30%
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8. Find the ratio of fundamental frequencies  $f_1/f_2$  for a pipe open at both ends when  $\frac{1}{3}$  of its length is later submerged in water.

- (A)  $\frac{3}{2}$
  - (B) 2
  - (C)  $\frac{4}{3}$
  - (D)  $\frac{3}{4}$
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9. A car starts from rest and accelerates uniformly at  $3 \text{ m/s}^2$ ; determine its velocity after 5 seconds.

- (A) 10 m/s
  - (B) 15 m/s
  - (C) 20 m/s
  - (D) 25 m/s
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10. Find the acceleration of a 2 kg block acted upon by a net force of 10 N.

- (A)  $2 \text{ m/s}^2$
- (B)  $5 \text{ m/s}^2$

(C)  $10 \text{ m/s}^2$

(D)  $20 \text{ m/s}^2$

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## Chemistry

11. Identify the product formed when  $\text{CH}_3\text{-CH}_2\text{-Br}$  reacts with alcoholic  $\text{KOH}$ .

(A)  $\text{CH}_3\text{CH}_2\text{OH}$

(B)  $\text{CH}_2 = \text{CH}_2$

(C)  $\text{CH}_3\text{CHO}$

(D)  $\text{CH}_3\text{COOH}$

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12. What is the oxidation state of oxygen in peroxides?

(A)  $-2$

(B)  $-1$

(C)  $0$

(D)  $+1$

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13. Identify the specific reagent used in the Swarts reaction (e.g.,  $\text{AgF}$  or  $\text{SbF}_3$ ).

(A)  $\text{AgCl}$

(B)  $\text{SbF}_3$

(C)  $\text{FeCl}_3$

(D)  $\text{HCl}$

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14. Which of the following is a disproportionation reaction: Clemmensen, Wolff-Kishner, or Cannizzaro?

(A) Clemmensen reaction

(B) Wolff-Kishner reaction

(C) Cannizzaro reaction

(D) None of these

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**15. Predict the product when an alcohol reacts with sodium metal.**

- (A) Alkane
  - (B) Sodium alkoxide + Hydrogen gas
  - (C) Ether
  - (D) Aldehyde
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