

MHT CET 2026 April 16 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:** Physics (+1 marks), Chemistry (+1 marks) and Mathematics (+2 marks).
- (vii) **Incorrect Answer:** (No Negative marking).
- (viii) **Unanswered/Marked for Review:** 0 marks.

1. If the statement $(p \wedge q) \rightarrow (r \vee \neg s)$ is False (F), what are the truth values of $p, q, r,$ and s respectively?

- (A) T, T, F, T
- (B) T, F, F, T
- (C) T, T, T, F
- (D) F, T, F, T

2. Evaluate the integral: $\int \frac{4x^2 \cot^{-1}(x^3)}{1+x^6} dx$ (where C is a constant of integration).

- (A) $\frac{2}{3}(\cot^{-1}(x^3))^2 + C$
(B) $-\frac{2}{3}(\cot^{-1}(x^3))^2 + C$
(C) $\frac{1}{3}(\cot^{-1}(x^3))^2 + C$
(D) $-\frac{1}{3}(\cot^{-1}(x^3))^2 + C$
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3. If $y = \sin^{-1}(3x - 4x^3)$, find the derivative $\frac{dy}{dx}$ in its standard form.

- (A) $\frac{3 - 12x^2}{\sqrt{1 - (3x - 4x^3)^2}}$
(B) $\frac{3 + 12x^2}{\sqrt{1 - (3x - 4x^3)^2}}$
(C) $\frac{3 - 12x^2}{1 - (3x - 4x^3)^2}$
(D) $\frac{12x^2 - 3}{\sqrt{1 - (3x - 4x^3)^2}}$
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4. Find the angle between non-zero vectors \mathbf{a} and \mathbf{b} if their dot product $\mathbf{a} \cdot \mathbf{b} = 0$.

- (A) 0°
(B) 45°
(C) 90°
(D) 180°
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5. Evaluate the definite integral: $\int_3^5 |x - 4| dx$.

- (A) 1
(B) 2
(C) 3
(D) 4
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6. Calculate the potential energy of a 1.5 kg block attached to a spring with $k = 100 \text{ N/m}$ displaced by 0.2 m.

- (A) 1 J
(B) 2 J
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(C) 4J

(D) 6J

7. At what temperature will the r.m.s. velocity of a hydrogen molecule be equal to that of an oxygen molecule at 47°C ?

(A) 40K

(B) 20K

(C) 10K

(D) 5K

8. Determine the equivalent capacitance of an infinite circuit formed by repeating identical capacitors of capacitance C .

(A) C

(B) $\frac{C}{2}$

(C) $\frac{C}{3}$

(D) $2C$

9. A wire of length L and resistance R is stretched to twice its length; what is the new resistance?

(A) R

(B) $2R$

(C) $3R$

(D) $4R$

10. Find the ratio of the de Broglie wavelengths of an alpha particle and a proton accelerated through the same potential.

(A) 1 : 1

(B) 1 : $\sqrt{2}$

(C) 1 : 2

(D) 1 : 4

11. Which of the following compounds will undergo a Cannizzaro reaction:

CH_3CHO , $\text{C}_6\text{H}_5\text{CHO}$, CH_3COCH_3 ?

- (A) CH_3CHO
 - (B) $\text{C}_6\text{H}_5\text{CHO}$
 - (C) CH_3COCH_3
 - (D) Both CH_3CHO and $\text{C}_6\text{H}_5\text{CHO}$
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12. Identify the strongest acid among: acetic acid, chloroacetic acid, dichloroacetic acid, and trichloroacetic acid.

- (A) Acetic acid
 - (B) Chloroacetic acid
 - (C) Dichloroacetic acid
 - (D) Trichloroacetic acid
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13. What is the difference in the oxidation number of Manganese (Mn) between KMnO_4 and MnO_2 ?

- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
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14. What product is formed when a ketone reacts with hydrazine (NH_2NH_2)?

- (A) Hydrazone
 - (B) Alcohol
 - (C) Ester
 - (D) Carboxylic acid
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15. Predict the major product formed when an alkene reacts with a hydrogen halide (e.g., HCl or HBr).

- (A) Alkane
 - (B) Alkyl halide
 - (C) Alcohol
 - (D) Ether
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