

MHT CET 2026 Mathematics Memory Based Question paper PDF

Mathematics

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) $-\frac{1}{3} (\cot^{-1}(x^3))^2 + C$
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) $\frac{12x^2-3}{\sqrt{1-(3x-4x^3)^2}}$

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°

5. Evaluate the definite integral:

$$\int_3^5 |x-4| dx$$

- (a) 1
- (b) 2
- (c) 3
- (d) 4

Physics

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
(c) 4 J
(d) 6 J
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) 40 K
(b) 20 K
(c) 10 K
(d) 5 K
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

Chemistry

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 $\text{C}_6\text{H}_5\text{CHO}$
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
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
14. What product is formed when a ketone reacts with hydrazine (NH_2NH_2)?
- (a) Hydrazone
 - (b) Alcohol
 - (c) Ester
 - (d) Carboxylic acid
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