

MHT CET 2026 Mathematics Memory Based Question paper PDF

Mathematics

1. Find the value of k if the function $f(x) = \frac{k \sin x + 2 \cos x}{\sin x + \cos x}$ is increasing for all x .
 - (a) $k < 2$
 - (b) $k = 2$
 - (c) $k \geq 2$
 - (d) $k \leq 2$
2. Calculate the area of the region bounded by the curve $y^2 = 4x$ and the line $x = 3$.
 - (a) $6\sqrt{3}$
 - (b) $8\sqrt{3}$
 - (c) $12\sqrt{3}$
 - (d) $4\sqrt{3}$
3. Find the general solution of the differential equation $\frac{dy}{dx} + \frac{y}{x} = x^2$.
 - (a) $y = \frac{x^3}{4} + \frac{C}{x}$
 - (b) $y = \frac{x^3}{3} + \frac{C}{x}$
 - (c) $y = \frac{x^3}{2} + \frac{C}{x}$
 - (d) $y = x^3 + \frac{C}{x}$
4. Determine the shortest distance between the lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x-2}{3} = \frac{y-4}{4} = \frac{z-5}{5}$.
 - (a) $\frac{2}{\sqrt{3}}$
 - (b) $\frac{2}{\sqrt{5}}$
 - (c) $\frac{2}{\sqrt{2}}$
 - (d) $\frac{2}{\sqrt{29}}$
5. If $\vec{a}$ and $\vec{b}$ are unit vectors and the angle between them is 60° , find $|\vec{a} - \vec{b}|$.
 - (a) 1
 - (b) $\sqrt{2}$
 - (c) $\sqrt{3}$
 - (d) 2

Physics

6. A particle performs SHM with an amplitude of 5 cm. Find its acceleration when it is 3 cm from the mean position (assume $\omega = 2 \text{ rad/s}$).
- (a) 3 cm/s^2
 - (b) 6 cm/s^2
 - (c) 12 cm/s^2
 - (d) 24 cm/s^2
7. Calculate the de-Broglie wavelength of an electron accelerated through a potential difference of 100 V.
- (a) $1.227 \text{ \AA}$
 - (b) 0.1227 nm
 - (c) 12.27 nm
 - (d) 0.01227 nm
8. Find the equivalent resistance between two opposite corners of a cube made of wires, each having resistance R .
- (a) $\frac{R}{6}$
 - (b) $\frac{5R}{6}$
 - (c) $\frac{R}{3}$
 - (d) $\frac{2R}{3}$
9. Determine the ratio of the speed of sound in Oxygen to that in Hydrogen at the same temperature.
- (a) 1 : 4
 - (b) 1 : 2
 - (c) 2 : 1
 - (d) 4 : 1

Chemistry

10. What is the oxidation state of Phosphorus in H_3PO_4 ?
- (a) +3
 - (b) +5
 - (c) +1
 - (d) +7
11. Which of the following polymers is a copolymer: Buna-S, Polythene, or PVC?
- (a) Polythene
 - (b) PVC
 - (c) Buna-S
 - (d) All of these
12. Calculate the pH of a 0.001 M NaOH solution at 25°C .
- (a) 3

- (b) 7
 - (c) 11
 - (d) 13
13. Name the reagent used in the conversion of benzene to nitrobenzene.
- (a) Concentrated HNO_3 only
 - (b) Concentrated H_2SO_4 only
 - (c) Mixture of concentrated HNO_3 and H_2SO_4
 - (d) Dilute HNO_3

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