

MHT CET 2026 Mathematics Memory Based Question paper PDF

Mathematics

1. The value of:

$$\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx$$

- (a) $\frac{\pi}{2}$
 - (b) $\frac{\pi}{3}$
 - (c) $\frac{\pi}{4}$
 - (d) $\frac{\pi}{6}$
2. If $\vec{a} = 2\hat{i} - \hat{j} + \hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - 3\hat{k}$, find the magnitude of $\vec{a} \times \vec{b}$.
- (a) $\sqrt{94}$
 - (b) $\sqrt{86}$
 - (c) $\sqrt{110}$
 - (d) $\sqrt{102}$
3. Find the truth value of the statement: "If 2 is even, then 5 is prime."
- (a) True
 - (b) False
 - (c) Cannot be determined
 - (d) None of these
4. Find the general solution of the differential equation $\frac{dy}{dx} + y = e^{-x}$.
- (a) $y = e^{-x}(x + C)$
 - (b) $y = xe^{-x} + C$
 - (c) $y = e^x(x + C)$
 - (d) $y = e^{-x} + C$
5. Determine the distance of the point $(1, 2, 3)$ from the plane $2x + 3y - z = 7$.
- (a) $\frac{2}{\sqrt{14}}$
 - (b) $\frac{4}{\sqrt{14}}$
 - (c) $\frac{1}{\sqrt{14}}$
 - (d) $\frac{3}{\sqrt{14}}$

Physics

6. Calculate the moment of inertia of a uniform circular disc of mass M and radius R about its diameter.
- (a) $\frac{1}{2}MR^2$
 - (b) $\frac{1}{4}MR^2$
 - (c) MR^2
 - (d) $\frac{3}{2}MR^2$
7. A wire of resistance R is stretched to triple its original length. Find the new resistance.
- (a) $3R$
 - (b) $6R$
 - (c) $9R$
 - (d) R
8. Find the energy of a photon with a wavelength of $4000 \text{ \AA}$. (Take $h = 6.63 \times 10^{-34} \text{ Js}$, $c = 3 \times 10^8 \text{ m/s}$).
- (a) $4.97 \times 10^{-19} \text{ J}$
 - (b) $3.31 \times 10^{-19} \text{ J}$
 - (c) $6.63 \times 10^{-19} \text{ J}$
 - (d) $2.48 \times 10^{-19} \text{ J}$
9. Determine the centripetal force acting on a 1000 kg car moving at 20 m/s around a curve of radius 50 m .
- (a) 4000 N
 - (b) 8000 N
 - (c) 10000 N
 - (d) 20000 N
10. What is the change in internal energy of a system if 500 J of heat is added and 200 J of work is done by the system?
- (a) 300 J
 - (b) 700 J
 - (c) 200 J
 - (d) 500 J

Chemistry

11. What is the oxidation number of Manganese (Mn) in the compound KMnO_4 ?
- (a) $+4$
 - (b) $+6$
 - (c) $+7$
 - (d) $+2$
12. Identify the product formed when Ethyl alcohol is heated with concentrated H_2SO_4 at 443 K .
- (a) Ethane
 - (b) Ethene

- (c) Diethyl ether
 - (d) Acetaldehyde
13. Which reagent is used in the Reimer–Tiemann reaction to convert phenol to salicylaldehyde?
- (a) CHCl_3 and NaOH
 - (b) HNO_3
 - (c) KMnO_4
 - (d) HCl
14. Calculate the pH of a 0.001 M NaOH solution at 298 K.
- (a) 11
 - (b) 10
 - (c) 3
 - (d) 7
15. Identify the type of crystal defect found in NaCl crystals.
- (a) Frenkel defect
 - (b) Schottky defect
 - (c) Metal excess defect
 - (d) Interstitial defect