

## MHT CET 2026 Mathematics Memory Based Question Paper PDF

**Physics**

- Twelve identical wires, each of resistance  $r$ , are joined to form a skeleton of a cube. The equivalent resistance between two diagonally opposite corners of the cube is:
  - $\frac{5}{6}r$
  - $\frac{3}{4}r$
  - $\frac{7}{12}r$
  - $\frac{12}{5}r$
- A long straight wire carries a current  $I$ . A proton travels with velocity  $v$  parallel to the wire at a distance  $d$  from it, in the same direction as the current. The magnetic force acting on the proton is:
  - Attractive, magnitude  $\frac{\mu_0 e I v}{2\pi d}$
  - Repulsive, magnitude  $\frac{\mu_0 e I v}{2\pi d}$
  - Attractive, magnitude  $\frac{\mu_0 e I v}{4\pi d}$
  - Zero
- A circular coil of  $N$  turns and radius  $R$  carries a current  $I$ . It is unwound and rewound to make another coil of radius  $R/2$ . For the same current, the ratio of the magnetic field at the center of the new coil to that of the old coil is:
  - 4 : 1
  - 2 : 1
  - 1 : 2
  - 1 : 4
- A disc of mass  $M$  and radius  $R$  has a concentric hole of radius  $R/2$ . Its moment of inertia about an axis passing through its center and perpendicular to its plane is:
  - $\frac{15}{32}MR^2$
  - $\frac{13}{32}MR^2$
  - $\frac{5}{16}MR^2$
  - $\frac{5}{8}MR^2$
- A uniform solid sphere of mass  $M$  and radius  $R$  is placed on a smooth horizontal surface. It is struck by a horizontal cue at a height  $h$  above the center. For the sphere to roll without slipping immediately after the impact, the value of  $h$  must be:
  - $R/2$
  - $2R/5$
  - $2R/3$
  - $3R/5$

## Chemistry

6. Which of the following compounds is isomeric with ether?
- (a) Carboxylic acid
  - (b) Alcohols
  - (c) Ester
  - (d) Aldehydes
7. Work done during reversible isothermal expansion of one mole of hydrogen gas at  $25^{\circ}\text{C}$  from pressure 0.5 atm to 1.0 atm (Given  $R = 2.0 \text{ cal}$ ) is:
- (a) 395.12
  - (b) 413.14
  - (c) 100
  - (d) None of these
8. Which pair of elements from Group 16 is metalloid in nature?
- (a) Se and Po
  - (b) Se and O
  - (c) Te and Po
  - (d) Te and Se
9. Colourless among the following is:
- (a)  $\text{Mn}^{2+}$
  - (b)  $\text{Ti}^{4+}$
  - (c)  $\text{Cu}^{2+}$
  - (d)  $\text{Fe}^{3+}$
10. What type of unit cell is formed by silver?
- (a) FCC
  - (b) SC
  - (c) BCC
  - (d) Base centered

## Mathematics

11. Let  $z$  be a complex number such that  $|z| + z = 3 + i$ ,  $i = \sqrt{-1}$ , then  $|z|$  is equal to:
- (a)  $\frac{\sqrt{41}}{4}$
  - (b)  $\frac{5}{3}$
  - (c)  $\frac{\sqrt{34}}{3}$
  - (d)  $\frac{5}{4}$
12. The negation of statement pattern  $(p \wedge \sim q) \rightarrow (p \vee \sim q)$  is:
- (a) A tautology
  - (b) A contingency

- (c) A contradiction  
(d) Equivalent to  $p \vee q$
13. If  $A = \begin{bmatrix} 1 & 2 \\ -1 & 4 \end{bmatrix}$  and  $A^{-1} = \alpha I + \beta A$ , where  $\alpha, \beta \in \mathbb{R}$  and  $I$  is the identity matrix of order 2, then  $4(\alpha + \beta) =$
- (a)  $\frac{8}{3}$   
(b)  $\frac{4}{3}$   
(c)  $\frac{16}{3}$   
(d)  $\frac{2}{3}$
14. If  $y = \cos^{-1} x$ , then  $\frac{d^2 y}{dx^2} =$
- (a)  $-\frac{x}{(1-x^2)^{3/2}}$   
(b)  $\frac{x}{(1-x^2)^{9/2}}$   
(c)  $-\frac{1}{(1-x^2)^{5/2}}$   
(d)  $\frac{1}{(1-x^2)^{7/2}}$
15. Evaluate the Integral:
- $$\int \frac{4x - 5}{2x + 1} dx$$
- (a)  $2x - \frac{7}{2} \log |2x + 1| + C$   
(b)  $2x + \frac{7}{2} \log |2x + 1| + C$   
(c)  $4x - \frac{5}{2} \log |2x + 1| + C$   
(d)  $2x - \frac{5}{2} \log |2x + 1| + C$