

MHT CET 2026 Mathematics Memory Based Question Paper PDF

Mathematics

1. The value of:

$$\int_0^4 \sqrt{\frac{4-x}{4+x}} dx$$

is:

- (a) $4(\pi - 2)$
 - (b) $2(\pi - 2)$
 - (c) $4(\pi + 2)$
 - (d) $2(\pi + 2)$
2. The range of the function $y = \log(\sin x)$ where $\sin x > 0$ is:
- (a) $[0, \infty)$
 - (b) $(-\infty, \infty)$
 - (c) $(-\infty, 0]$
 - (d) $[-1, 1]$
3. If $x = a \sin t - b \cos t$ and $y = a \cos t + b \sin t$, and it is given that $\frac{d^2y}{dx^2} = 0$, then:
- (a) $y = \text{constant}$
 - (b) $y = x$
 - (c) $y = ax + b$
 - (d) $y = x + c$
4. If $\sin x \cos x = \frac{1}{4}$, then the general solution is:
- (a) $x = n\pi + (-1)^n \frac{\pi}{6}$
 - (b) $x = \frac{n\pi}{2} + (-1)^n \frac{\pi}{12}$
 - (c) $x = \frac{n\pi}{2} + \frac{\pi}{12}$
 - (d) $x = n\pi \pm \frac{\pi}{6}$
5. If $n \in \mathbb{Z}$, then the expression $\frac{2^n}{(1-i)^{2n}} + \frac{(1+i)^{2n}}{2^n}$ is equal to:
- (a) 0
 - (b) $2i^n$
 - (c) $2 \cos(n\pi/2)$
 - (d) 2^n

Chemistry

6. Which of the following reagents is used to distinguish primary, secondary, and tertiary alcohols?
- (a) Lucas Test reagent
 - (b) Hunsdiecker reagent
 - (c) Grignard Reaction reagent
 - (d) Benedict's reagent
7. Which of the following has the highest boiling point?
- (a) Propane
 - (b) Ethyl chloride
 - (c) Ethyl alcohol
 - (d) Ethane
8. Which of the following compounds is used for the preparation of methyl phenyl ether (anisole)?
- (a) Sodium phenoxide and methyl iodide
 - (b) Phenol and chloroform
 - (c) Benzene and methanol
 - (d) Sodium acetate and methyl chloride
9. The molar conductivity of 0.1 M acetic acid is $5 \text{ S cm}^2 \text{ mol}^{-1}$ and its limiting molar conductivity is $390 \text{ S cm}^2 \text{ mol}^{-1}$. Calculate the concentration of H^+ ions.
- (a) $1.28 \times 10^{-3} \text{ M}$
 - (b) $2.56 \times 10^{-3} \text{ M}$
 - (c) $3.84 \times 10^{-3} \text{ M}$
 - (d) $5 \times 10^{-3} \text{ M}$
10. Find the oxidation state of phosphorus in orthophosphoric acid.
- (a) +1
 - (b) +3
 - (c) +5
 - (d) -3

Physics

11. A solid sphere of mass M and radius R rolls down an inclined plane of angle θ without slipping. The minimum coefficient of static friction required is:
- (a) $2/7 \tan \theta$
 - (b) $5/7 \tan \theta$
 - (c) $2/5 \tan \theta$
 - (d) $1/2 \tan \theta$
12. A uniform circular disc of mass M and radius R is rotating with an angular velocity ω about an axis passing through its center and perpendicular to its plane. If a piece of mass m is gently placed on its edge, the new angular velocity will be:

- (a) $M\omega/(M + 2m)$
 - (b) $M\omega/(M + m)$
 - (c) $2M\omega/(M + 2m)$
 - (d) $M\omega/(2M + m)$
13. The radius of gyration of a hollow sphere of mass M and radius R about a tangent is:
- (a) $\sqrt{5/3}R$
 - (b) $\sqrt{7/5}R$
 - (c) $\sqrt{2/3}R$
 - (d) $\sqrt{3/5}R$
14. Two capillary tubes of radii r_1 and r_2 are dipped vertically in a liquid. If the liquid rises to heights h_1 and h_2 respectively, then the ratio h_1/h_2 is:
- (a) r_1/r_2
 - (b) r_2/r_1
 - (c) r_1^2/r_2^2
 - (d) r_2^2/r_1^2
15. The root mean square velocity of an ideal gas at constant pressure varies with density as:
- (a) d^2
 - (b) d
 - (c) $\sqrt{d}$
 - (d) $1/\sqrt{d}$