

MHT CET 2026 Mathematics Memory Based Question paper PDF

Mathematics

1. If the statement $(p \wedge q) \rightarrow (r \vee \neg s)$ is False, find the truth values of p, q, r , and s .

- (a) $p = \text{T}, q = \text{T}, r = \text{F}, s = \text{T}$
- (b) $p = \text{F}, q = \text{T}, r = \text{F}, s = \text{T}$
- (c) $p = \text{T}, q = \text{F}, r = \text{T}, s = \text{F}$
- (d) $p = \text{F}, q = \text{F}, r = \text{T}, s = \text{T}$

2. Find the value of k if the function $f(x) = \frac{k \cos x}{\pi - 2x}$ is continuous at $x = \frac{\pi}{2}$.

- (a) 1
- (b) 2
- (c) -1
- (d) 0

3. Find the unit vector perpendicular to both $\vec{a} = 2\hat{i} - \hat{j} + \hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - 3\hat{k}$.

- (a) $\frac{-\hat{i} + 7\hat{j} + 5\hat{k}}{5\sqrt{3}}$
- (b) $\frac{\hat{i} - 7\hat{j} - 5\hat{k}}{5\sqrt{3}}$
- (c) $\frac{-\hat{i} + 7\hat{j} + 5\hat{k}}{\sqrt{75}}$
- (d) $\frac{\hat{i} + 7\hat{j} + 5\hat{k}}{5\sqrt{3}}$

4. Evaluate the definite integral:

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

- (a) 0
- (b) $\frac{\pi}{4}$
- (c) $\frac{\pi}{2}$
- (d) π

5. If $y = \sin^{-1}(3x - 4x^3)$, find $\frac{dy}{dx}$.

- (a) $\frac{3-12x^2}{\sqrt{1-(3x-4x^3)^2}}$
- (b) $\frac{3-12x^2}{\sqrt{1-(3x-4x^3)}}$
- (c) $\frac{12x^2-3}{\sqrt{1-(3x-4x^3)^2}}$
- (d) $\frac{3}{\sqrt{1-(3x-4x^3)^2}}$

Physics

6. A particle moves with a constant velocity of 5 m/s in a circular path of radius 2 m; calculate its centripetal acceleration.
- (a) 5 m/s^2
 - (b) 10 m/s^2
 - (c) 12.5 m/s^2
 - (d) 25 m/s^2
7. A block of mass 5 kg is on a frictionless surface; find its acceleration when a force of 10 N is applied.
- (a) 1 m/s^2
 - (b) 2 m/s^2
 - (c) 5 m/s^2
 - (d) 10 m/s^2
8. What is the time period of a simple pendulum of length 1 m if $g = 9.8 \text{ m/s}^2$?
- (a) 1 s
 - (b) 2 s
 - (c) 2.01 s
 - (d) 3 s
9. Determine the minimum speed at the topmost point of a vertical circle of radius L for the string to remain taut.
- (a) $\sqrt{gL}$
 - (b) $\sqrt{2gL}$
 - (c) $\sqrt{3gL}$
 - (d) gL
10. Calculate the equivalent capacitance of an infinite circuit formed by repeating identical capacitors of capacitance C .
- (a) 0
 - (b) C
 - (c) $2C$
 - (d) $\frac{C}{2}$

Chemistry

11. Identify the product formed when phenol reacts with bromine water.
- (a) Bromobenzene
 - (b) 2,4,6-Tribromophenol
 - (c) Phenyl bromide
 - (d) Benzoic acid
12. What is the IUPAC name for the compound $\text{CH}_3 - \text{CH}(\text{OH}) - \text{CH}_2 - \text{CHO}$?
- (a) 3-Hydroxybutanal

- (b) 2-Hydroxybutanal
 - (c) 4-Hydroxybutanal
 - (d) Butanol
13. Which reagent is used in the Lucas test to distinguish between primary, secondary, and tertiary alcohols?
- (a) Dilute HCl
 - (b) Concentrated HCl and ZnCl_2
 - (c) NaOH
 - (d) KMnO_4
14. Define the coordination number and oxidation state of the central metal ion in $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$.
- (a) Coordination number = 4, Oxidation state = +2
 - (b) Coordination number = 6, Oxidation state = +3
 - (c) Coordination number = 6, Oxidation state = +2
 - (d) Coordination number = 3, Oxidation state = +3
15. Calculate the osmotic pressure of a 0.1 M solution at 27°C .
- (a) 2.46 atm
 - (b) 1.23 atm
 - (c) 0.82 atm
 - (d) 4.10 atm