

MHT CET 2025 Memory Based Question Paper PDF (April 21, 2025)(Shift 1)

Questions :

1. If $a(4 + x^2) = x + y - x^3 = a^3 \frac{dy}{dx}$ at $x = 1$, then the value of $\frac{dy}{dx}$ is:

- (A) 5
- (B) 4
- (C) 3
- (D) 2

2. Evaluate the definite integral:

$$\int_0^{\frac{\pi}{2}} \frac{dx}{1 + (\cot x)^{101}} = ?$$

- (A) $\frac{\pi}{4}$
- (B) $\frac{\pi}{2}$
- (C) $\frac{1}{2}$
- (D) 1

3. For all real x , the minimum value of the function $f(x) = \frac{1-x+x^2}{1+x+x^2}$ is:

- (A) $\frac{1}{3}$
- (B) 0
- (C) 3
- (D) 1

4. If $a(u + x^2) = x$ and $y - x^3 = a^2$, then $\frac{dy}{dx}$ at $x = 1$ is:

5. Approximate value of $\cos 59^\circ$ is:

- (A) 0.50
- (B) 0.61

(C) 0.75

(D) 0.85

6. Evaluate the integral: $\int \log((2+x)^{2+x}) dx$

(A) $(2+x)^{2+x} + C$

(B) $(2+x) \log((2+x)^{2+x}) + C$

(C) $(2+x) \cdot (2+x)^x + C$

(D) $(2+x)(2+x)^x(\log(2+x) + 1) + C$

7. If $x^y + y^x = a^b$, then $\frac{dy}{dx}$ at $x = 1, y = 2$ is:

(A) -1

(B) 1

(C) 2

(D) $\frac{1}{2}$

8. What is the correct order of thermal stability of the following carbonates?

$\text{BaCO}_3, \text{MgCO}_3, \text{SrCO}_3, \text{CaCO}_3$

(A) $\text{MgCO}_3 < \text{CaCO}_3 < \text{SrCO}_3 < \text{BaCO}_3$

(B) $\text{BaCO}_3 < \text{SrCO}_3 < \text{CaCO}_3 < \text{MgCO}_3$

(C) $\text{BaCO}_3 > \text{MgCO}_3 > \text{SrCO}_3 > \text{CaCO}_3$

(D) $\text{MgCO}_3 > \text{CaCO}_3 > \text{SrCO}_3 > \text{BaCO}_3$

9. Which of the following plots gives a straight line for a zero-order reaction?

(A) $[A]$ vs t

(B) $\log[A]$ vs t

(C) $1/[A]$ vs t

(D) $\ln[A]$ vs t

11. For a first-order reaction, the slope of the graph between $\log[A]$ vs time is equal to:

- (A) $-\frac{k}{2.303}$
 - (B) k
 - (C) $2.303k$
 - (D) $-2.303k$
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12. The magnetic moment of Mn^{3+} is:

- (A) 1.73 BM
 - (B) 2.83 BM
 - (C) 4.90 BM
 - (D) 5.92 BM
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13. Which trend is correct regarding ionic radius in the 4f-series (lanthanides)?

- (A) Radius increases from La^{3+} to Lu^{3+}
 - (B) Radius remains same
 - (C) Radius decreases across the series
 - (D) No regular trend observed
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14. Which of the following d-block elements has the highest melting point?

- (A) Zn
 - (B) Fe
 - (C) Cr
 - (D) W
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15. At a given temperature, which of the following statements is correct regarding the solubility of a solid in a liquid?

- (A) It always increases with increase in temperature.
 - (B) It always decreases with increase in temperature.
 - (C) It may increase or decrease depending on the enthalpy change.
 - (D) It does not depend on temperature.
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16. Which of the following is a primary alcohol?

- (A) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
 - (B) $(\text{CH}_3)_2\text{CHOH}$
 - (C) $(\text{CH}_3)_3\text{COH}$
 - (D) None of these
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17. Which of the following monomers undergo addition polymerization?

- (A) Ethene
 - (B) Acetic acid
 - (C) Glucose
 - (D) Glycerol
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18. Which of the following is the polymer formed from acrylonitrile?

- (A) Polyvinyl chloride (PVC)
 - (B) Polyacrylonitrile (PAN)
 - (C) Teflon
 - (D) Nylon-6
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19. Thermal stability order of Group 1 hydroxides is:

- (A) $\text{LiOH} < \text{NaOH} < \text{KOH} < \text{RbOH} < \text{CsOH}$
 - (B) $\text{CsOH} < \text{RbOH} < \text{KOH} < \text{NaOH} < \text{LiOH}$
 - (C) $\text{LiOH} > \text{NaOH} > \text{KOH} > \text{RbOH} > \text{CsOH}$
 - (D) $\text{LiOH} = \text{NaOH} = \text{KOH} = \text{CsOH}$
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20. Which of the following is not a transition metal?

- (A) Zn
 - (B) Fe
 - (C) Cr
 - (D) Cu
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