

MHT CET 2022 Mathematics Memory Based Question Paper PDF

1. Citric acid has the molecular formula $C_6H_8O_7$. How many carbon atoms are present in n moles of citric acid?
 - (1) $3n$
 - (2) $6n$
 - (3) $2n$
 - (4) $4n$
2. Which of the following compounds is likely to show both Frenkel and Schottky defects in its crystalline form?
 - (1) AgBr
 - (2) CsCl
 - (3) KBr
 - (4) ZnS
3. What is the correct decreasing order of bond enthalpy for halogens?
 - (1) $Cl_2 > Br_2 > F_2 > I_2$
 - (2) $F_2 > Cl_2 > Br_2 > I_2$
 - (3) $Cl_2 > F_2 > Br_2 > I_2$
 - (4) $I_2 > Br_2 > Cl_2 > F_2$
4. Which of the following is an example of a branched-chain polymer?
 - (1) High-density polyethylene (HDPE)
 - (2) Low-density polyethylene (LDPE)
 - (3) Polyvinyl chloride (PVC)
 - (4) Nylon-6,6
5. Mendius reduction involves the reduction of alkyl nitrites or cyanides to primary amines using which of the following reagents?
 - (1) Na/C_2H_5OH
 - (2) $LiAlH_4$

- (3) Sn/HCl
(4) H_2/Pd
6. The cryoscopic constant (K_f) is defined as the depression in freezing point produced when the molality of the solution is:
- (1) 0.1 m
(2) 1 m
(3) 10 m
(4) 0.5 m
7. Which of the following equimolar solutions will exhibit the maximum depression in freezing point?
- (1) Glucose
(2) NaCl
(3) CaCl_2
(4) Urea
8. What is the SI unit of molar conductivity (Λ_m)?
- (1) $\text{S} \cdot \text{m}^2 \cdot \text{mol}^{-1}$
(2) $\text{S} \cdot \text{m}^{-2} \cdot \text{mol}^{-1}$
(3) $\Omega \cdot \text{m}^2 \cdot \text{mol}^{-1}$
(4) $\text{S} \cdot \text{m}^2 \cdot \text{mol}$
9. The density of a unit cell is given by the formula $\rho = \frac{Z \cdot M}{a^3 \cdot N_A}$. If a metal crystallizes in a face-centered cubic (FCC) lattice, what is the value of Z?
- (1) 1
(2) 2
(3) 4
(4) 6
10. Polymorphism is the property where a single substance exists in two or more crystalline forms. Which of the following statements regarding polymorphism is **INCORRECT**?
- (1) Graphite and Diamond are polymorphs of Carbon.
(2) Polymorphs have different physical properties.

- (3) Polymorphs are also called allotropes in the case of elements.
- (4) Polymorphs always have the same crystal structure.

11. Which of the following elements is the central metal ion in the chlorophyll complex?

- (1) Iron (Fe)
- (2) Magnesium (Mg)
- (3) Copper (Cu)
- (4) Manganese (Mn)

12. Which of the following is classified as a natural polymer?

- (1) Polythene
- (2) Starch
- (3) PVC
- (4) Teflon

13. In a reversible isothermal expansion of an ideal gas, the work done (W_{max}) is maximum. This occurs when the process is carried out in:

- (1) A single step
- (2) Two steps
- (3) Infinite steps
- (4) Three steps

14. Calculate the pH of a 1.0×10^{-3} M solution of a strong monobasic acid.

- (1) 1
- (2) 2
- (3) 3
- (4) 4

15. According to the First Law of Thermodynamics, the relation between internal energy change (ΔU), heat (Q), and work (W) is:

- (1) $\Delta U = Q - W$
- (2) $\Delta U = Q + W$
- (3) $Q = \Delta U - W$
- (4) $W = \Delta U + Q$

16. What is the general electronic configuration of the 3d series elements (transition metals)?

- (1) $[Ar]3d^{1-10}4s^2$
- (2) $[Ar]3d^14s^{1-2}$
- (3) $[Ar]4d^{1-10}5s^2$
- (4) $[Ar]3d^54s^1$

17. The unit of the rate constant (k) for a first-order reaction is:

- (1) $mol \cdot L^{-1} \cdot s^{-1}$
- (2) $L \cdot mol^{-1} \cdot s^{-1}$
- (3) s^{-1}
- (4) $L^2 \cdot mol^{-2} \cdot s^{-1}$

18. The freezing point of a solution is always _____ than the freezing point of the pure solvent.

- (1) Higher
- (2) Lower
- (3) Same
- (4) Double

19. The rate law for a reaction $2A + B \rightarrow C$ is found to be $Rate = k[A][B]^2$. If the concentration of B is doubled, the rate of reaction will:

- (1) Double
- (2) Become four times
- (3) Remain same
- (4) Become eight times

20. Which of the following is **NOT** a method for the preparation of phenol?

- (1) From Chlorobenzene (Dow's process)
- (2) Direct oxidation of Benzene
- (3) From Aniline (Diazotization)
- (4) From Cumene

21. The major product formed in the Reimer-Tiemann reaction of phenol with chloroform and aqueous sodium hydroxide is:

- (1) Salicylaldehyde

- (2) Salicylic Acid
- (3) Phenol
- (4) Bromobenzene

22. What is the monomer of the synthetic rubber Neoprene?

- (1) Isoprene
- (2) Chloroprene
- (3) Styrene
- (4) Acrylonitrile

23. The Wurtz-Fittig reaction is used to prepare:

- (1) Alkanes
- (2) Alkenes
- (3) Alkylbenzenes
- (4) Haloarenes