MHT-CET Practice Question Paper

Subject : Chemistry

Time: 45 minutes **Test no : 03** **Marks : 50**

All the questions are compulsory and contain one mark for each

1. In face centred cubic unit cell, what is volume occupied?
   a) $\frac{4}{3}\pi r^3$ b) $\frac{8}{3}\pi r^3$
   c) $\frac{16}{3}\pi r^3$ d) $\frac{64r^3}{\sqrt[3]{3}}$
2. A metal crystallizes in a face centred cubic structure. If the edge length of its unit cell is 'a' the closest approach between two atoms in metallic crystal will be_____.
   a) 2a b) $2\sqrt{2a}$
   c) $\sqrt{2a}$ d) $\frac{a}{\sqrt{2}}$
3. Element 'B' forms ccp structure and A occupies half of the octahedral voids while oxygen atoms occupy all the tetrahedral voids the structure of bimetallic oxide is__.
   a) AB_2O_4 b) A_4B_2O
   c) A_2B_2O d) A_2BO_4
4. Which type of defect has the presence of cations in the interstitial sites?
   a) Schottky defect
   b) Vacancy defect
   c) Frenkel defect
   d) Metal deficiency defect
5. The vapour presence of pure heptane and pure octane are 92 and 31 torr respectively at 40 degree Celsius. The total vapour pressure of a solution containing 1.00 mole of heptane and 4.00 moles of octane is _____.
   a) 18.4 b) 24.8
   c) 43.2 d) 51.2
6. On dissolving 18 g solid in 100 g H_2O at 20 degrees Celsius water vapour pressure decreases from 17.53 mm to 17.22 mm. The molecular weight of solid is ___.
   a) 18 g mol^{-1} b) 183 mol^{-1}
   c) 27 mol^{-1} d) 274 g mol^{-1}
7. An aqueous dilute solution containing non-volatile solute boils at 100.052 degree Celsius. What is the molarity of solution? (K_b = 0.52 kg mol^{-1} K; Boiling temperature of water = 100 degree Celsius)
   a) 0.1 m b) 0.01 m
   c) 0.001 m d) 1.0 m
8. The osmotic pressure of solution at zero degree Celsius is 4 atm. What will be the osmotic pressure at 546 K under similar condition?
   a) 2 atm b) 8 atm
   c) 4 atm d) 0.5 atm
9. The pH of 01.01 M HCL solution is____.
   a) 1.0 b) 1.7
   c) 2.0 d) 12.0
10. The pH of a solution is 3.12. The pOH of this solution is__
    a) 10.48 b) 10.88
    c) 10.52 d) 11.12
11. For an aqueous natural solution at 298 K, $[H_3O^+]$ is equal to ___M.
    a) $1x10^7$ b) $1x10^{14}$
    c) $1x10^{-7}$ d) $1x10^{-14}$
12. which of the following is a salt derived from strong acid and strong base?
    a) KNO_3 b) CH_3COONH_4
    c) Na_2CO_3 d) $CuCl_2$
13. the first law of thermodynamics for isothermal process is ____
    a) Q = -W b) $\Delta U = W$
    c) $\Delta U = Q_V$ d) $\Delta U = Q_V$
14. which among the following is a feature of adiabatic expansion?
    a) $\Delta V < 0$ b) $\Delta U < 0$
    c) $\Delta U > 0$ d) $\Delta T = 0$

15. Correct representation of the heat supplied at a constant pressure and constant volume in gaseous reaction is _____.
    a) $H_2 – H_1 + U_2 – U_1 = n_2RT – n_1RT$
    b) $H_1 – H_2 + U_1 – U_2 = n_2RT – n_1RT$
    c) $H_2 – H_1 + U_1 – U_2 = n_2RT – n_1RT$
    d) $H_2 – H_1 + U_2 – U_1 = n_1RT – n_2RT$

16. The heat of combustion of carbon to CO_2 is -393.5 kJ mol^{-1}. The heat released upon formation of 35.2 g of CO_2 from carbon and oxygen gas is _____.
    a) -630 kJ b) -3.15 kJ
    c) -315 kJ d) +315 kJ

17. The molar conductivity of our 0.5 mol/dm^3 solution of $AgNO_3$ with electrolytic conductivity of 5.76 x 10^{-3} S cm^{-1} at 298 K is _____.
    a) 28.8 S cm^2/mol b) 2.88 S cm^2/mol
    c) 11.52 S cm^2/mol d) 0.086 S cm^2/mol

18. The charge carried by 1 millimole of M^{n+} ions is 193 coulombs. The value of n is____.
    a) 1 b) 2
    c) 3 d) 4

19. How many Faraday's of electricity are required to deposit 10 g of calcium from molten calcium chloride using inert electrodes?
    (molar mass of calcium = 40 g mol^{-1})
    a) 0.5 F b) 1 F
    c) 0.25 F d) 2 F

20. The pressure of H_2 required to make the potential of H_2 -electrode zero in pure water at 298 K is _____.
    a) 10^{-10} atm b) 10^{-4} atm
    c) 10^{-14} atm d) 10^{-12} atm

21. Number of reactant molecules participating in a chemical reaction is called_____
    a) decay constant b) molecularity
    c) rate law d) order

22. Vinod catalyst increases the rate of chemical reaction, the rate constant ____.
    a) remains constant
    b) increases
    c) decreases
    d) may increase or decrease depending on the order of reaction

23. The rate constant is doubled when temperature increases from 27 degree Celsius to 37 degree Celsius. Activation energy in kJ is _____.
    a) 34 b) 54
    c) 100 d) 50

24. Identify a metalloid from the following list of elements.
    a) Carbon b) Neon
    c) Sodium d) Tellurium

25. The correct geometry and hybridization for XeF_4 are _____ respectively.
    a) square planar, sp^3d^2
    b) octahedral, sp^3d^2
    c) trigonal bipyramidal, sp^3d
    d) planar triangle, sp^3d^3

26. Which among the following is the most reactive?
    a) CL_2 b) Br_2
    c) I_2 d) ICl

27. The atomic radius of Ag is closest to_____.
    a) Au b) Ni
    c) Hg d) Cu

28. Which one of the following lanthanide ions does not exhibit paramagnetism?
    a) Lu^{3+} b) Ce^{3+}
    c) Eu^{3+} d) Yb^{3+}

29. Percentage of carbon in steel is _____.
    a) 0.2 to 2% b) less than 0.2%
    c) 4% d) more than 4%

30. How many ions per molecule are produced in the solution when Mohr's salt is dissolved in excess of water?
    a) 4 b) 5
    c) 6 d) 10

31. The number of possible isomers for the complex $[Co(en)_2Cl_2]Cl$ will be_____.
    (en = ethylenediamine)
    a) 3 b) 4
    c) 2 d) 1

32. The IUPAC name of the complex ion formed when gold dissolved in aqua regia is _____.
    a) tetrachloridoaurate (III)
    b) tetrachloridoaurate (I)
    c) tetrachloridoaurate (II)

d) dichloridoaurate (III)

33. (+)2-Methylbutan-1-ol and (-)2-methylbutan-1-ol have different values for which property?
    a) Boiling point
    b) Relative density
    c) Refractive index
    d) Specific rotation

34. In alkaline hydrolysis of tert-butyl bromide, the order of reaction with respect nucleophile is _____.
    a) zero b) first
    c) pseudo d) second

35. Chlorobenzene on heating with sodium hydroxide under pressure at 623 K gives _____.
    a) benzoic acid b) chlorophenol
    c) phenol d) benzaldehyde

36. Which one of the following compounds gives a secondary alcohol upon treatment with methyl magnesium bromide?
    a) Formaldehyde b) Formic Acid
    c) Acetaldehyde d) Acetone

37. Which will give immediate turbidity on shaking with HCL at room temperature?
    a) 2-Methylbutan-1-ol
    b) 2-Methylpropan-2-ol
    c) 2-Ethylbutan-1-ol
    d) 3-Methylbutan-1-ol

38. Name the catalyst used in commercial method of preparation of phenol
    a) Silica
    b) Calcium phosphate
    c) Anhydrous aluminium chloride
    d) Cobalt naphthenate

39. Heating a mixture of ethyl alcohol and acetic acid in the presence of conc. H_2SO_4 produces of fruity smelling compound. This reaction is called _____.
    a) neutralization
    b) ester hydrolysis
    c) esterification
    d) Williamson's synthesis

40. In liquid phase, acetic acid exists as a _____.
    a) monomer b) dimer
    c) trimer d) tetramer

41. From which of the following tertiary butyl alcohol is obtained by the action of methyl magnesium iodide?
    a) HCHO b) CH_3CHO
    c) CH_3COCH_3 d) CO_2

42. Na/ethanol is a good _____.
    a) dehydrating agent
    b) oxidising agent
    c) reducing agent
    d) catalyst

43. Lower aliphatic amines poses characteristic _____ odour.
    a) fruity b) fishy
    c) pungent d) garlic like

44. Alkylation of amines can be carried out by using _____.
    a) alcohol b) ammonia
    c) alkane d) alkyl halide

45. Carbohydrates can be represented as ____.
    a) C_nH_{2n+2} b) $C_n(H_2O)_{2n}$
    c) $C_x(H_2O)_y$ d) $C_nH_{2n+1}O$

46. Glucose is an example of _____.
    a) aldohexose b) ketohexose
    c) aldopentose d) ketopentose

47. Acetylation of glucose gives _____.
    a) glucose acetate
    b) glucose triacetate
    c) glucose pentaacetate
    d) glucose diacetate

48. Polymers are _____.
    a) micromolecules
    b) macromolecules
    c) sab-micromolecules
    d) sab-macromolecules

49. Which is a natural occurring polymer?
    a) polythene b) PVC
    c) Terylene d) Linen

50. A condensation polymer among the following is _____
    a) dacron b) PVC
    c) polystyrene d) teflon