Studentpad

MHT-CET-XII CHEMISTRY 2022-23

Time : 150 Min	Chem : Full Portion Paper	Marks : 50

01) Ionic solids, with Schottky defects, contain in their structure
A) cation vacancies and interstitial cations.
B) cation vacancies only.
C) anion vacancies and interstitial anions.
D) equal number of cation and anion vacancies.

02) Excess of Na^+ ions in our system causes
A) low B.P.
B) high B.P.
C) diabetes.
D) anaemia.

03) When acetaldehyde is heated with Fehling solution, it gives a red precipitate of
A) Cu
B) Cu_2O
C) CuO
D) $Cu(OH)_2$

04) Froth floatation process for the concentration of ores is an illustration of the practical application of
A) absorption.
B) adsorption.
C) coagulation.
D) sedimentation.

05) What is the hybridisation of SO_2 molecule?
A) SP^3
B) SP^3d
C) SP^2
D) SP

06) Which of the following is used as a catalyst for preparing Grignard reagent?
A) Iodine powder
B) Activated charcoal
C) Iron powder
D) Manganese dioxide

07) What is the correct order of basic strength?
A) $CH_3NH_2 > (CH_3)_2NH > (CH_3)_3N > NH_3$
B) $(CH_3)_3N > (CH_3)_2NH > CH_3NH_2 > NH_3$
C) $NH_3 > (CH_3)_3N > CH_3NH_2 > (CH_3)_2NH$
D) $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N > NH_3$

08) How many space lattices are obtainable from the different crystal systems?
A) 230
B) 32
C) 14
D) 7

09) Estimate the mass percentage of different constituent elements in urea. (At . mass of C=12, O = 16, N=14, H=1)
A) C=20%, O=26.67%, N=20.67%, H=3.67%
B) C=40%, O=20.67%, N=46.67%, H=3.67%
C) C=10%, O=36.67%, N=20.67%, H=6.67%
D) C=20%, O=26.67%, N=46.67%, H=6.67%

10) In the balanced chemical reaction, $IO_3^- + aI^- + bH^+ \rightarrow cH_2O + dI_2$ Find a, b, c and d.
A) 5,6,3,3
B) 5,6,5,5,
C) 3,5,3,6
D) 5,3,6,3

11) Suppose two flasks X and Y have capacity 1 L and 2 L respectively and each of them contains 1 mole of a gas then, What would be the pressure in flask X if temperatures of the flasks are so adjusted that average speed of molecules in X is twice as those in Y?
A) Twice of that in Y
B) 8 times of that in Y
C) Same as that in Y
D) Half of that in Y

12) Match the following.

	Column I (Pair of isomers)	Column II (Type of isomerism)
(p)	(I) $[Co(NH_3)_6][Cr(CN)_6]$ (II) $[Cr(NH_3)_6][Co(CN)_6]$	1. Ionisation
(q)	(III) $[PtCl_2(NH_3)_4]Br_2$ (IV) $[PtBr_2(NH_3)_4]Cl_2$	2. Hydrate
(r)	(V) $[Co(SCN)(NH_3)_5]Cl_2$ (VI) $[Co(NCS)(NH_3)_5]Cl_2$	3. Coordination
(s)	(VII) $[Cr(H_2O)_6]Cl_3$ (VIII) $[CrCl_2(H_2O)_4]Cl.2H_2O$	4. Geometrical
		5. Linkage

A) p-1, q-3, r-5, s-2
B) p-1, q-3, r-2, s-5
C) p-3, q-1, r-5, s-2
D) p-4, q-1, r-5, s-2

13) If the solubility product of MOH is 1×10^{-10} $mol^2\ dm^{-6}$, then find the pH of its aqueous solution.
A) 12
B) 9
C) 3

D) 6

14) When a graph of $\log_{10} k$ is plotted against 1/T, find the slope of the line?

A) $-\frac{E_a}{2.303}$

B) $-\frac{2.303\,R}{E_a}$

C) $-\frac{E_a}{R}$

D) $-\frac{E_a}{2.303\,R}$

15) Sea weed is employed as a source of manufacture of
A) Cl
B) Br
C) I
D) F

16) What is the standard cell potential for the cell $Zn/Zn^{2+}(1M)||Cu^{2+}(1M)/Cu$? ($E^o$ for $Zn/Zn^{2+}(1M) = -0.76\ V$ & $Cu^{2+}/Cu = +0.34\ V$)

A) $-0.76-(+0.34) = -1.10\ V$

B) $0.34-(-0.76) = 1.10\ V$

C) $-0.34+0.76 = +0.42\ V$

D) $-0.76+(-0.34) = -0.42\ V$

17) For which of the processes is ΔS negative?

A) $H_2(g) \rightarrow 2H(g)$

B) $2SO_3(g) \rightarrow 2SO_2(g)+O_2(g)$

C) $N_2(g)\ 1atm \rightarrow N_2(g)\ 8\ atm$

D) $C_{(diamond)} \rightarrow C_{(graphite)}$

18) For a reactions $A+B \rightarrow$ product, it was found that rate of reaction increases four times, if concentration of 'A' is doubled, but the rate of reaction remains unaffected, if concentration of 'B' is doubled. Hence, the rate law for the reaction is

A) $rate = k[A]^2$

B) $rate = k[A][B]$

C) $rate = k[A]^2[B]^2$

D) $rate = k[A]^2[B]^1$

19) The phenomenon of _____ in which water transportation in plants takes place.
A) diffusion
B) osmosis
C) reverse diffusion
D) reverse osmosis

20) $(CH_3)_4\overset{+}{N}$ is neither an electrophile , nor a nucleophile as it
A) can act as Lewis acid and base
B) neither has electron pair available for donation nor can accomodate electron since all shells of nitrogen are fully occupied
C) does not have electron pair for donation as well as cannot attract electron pair
D) none of these

21) The hydrogen electrode is dipped in a solution of $pH = 3$ at 25°C. What would be the potential of the cell? (the value of 2.303 RT/F is 0.059 V)
A) 0.087 V
B) 0.177 V
C) -0.177 V
D) 0.059 V

22) The chemical processes in the production of steel from hematite ore involve
A) oxidation.
B) reduction.
C) oxidation followed by reduction.
D) reduction followed by oxidation.

23) The ion has 18 electrons and 20 neutrons. What is its mass number if it has charge of +1 unit?
A) 38
B) 35
C) 39
D) 20

24) The mixture of concentrated HCl and HNO_3 made in 3 : 1 ratio contains
A) N_2O_4
B) NCl_3
C) NOCl
D) ClO_2

25) The solvent which neither accepts proton nor donates proton is called
A) amphiprotic.
B) aprotic.
C) neutral.
D) amphoteric.

26) Which of the following has a higher glass-transition temperature?
A) Polystyrene
B) Polyvinyl chloride
C) Polypropylene
D) Polyethylene

27) Among the three conformations of ethane, find the correct order of their stability.
A) Eclipsed > staggered > gauche
B) Eclipsed > gauche > staggered
C) Staggered > gauche > eclipsed
D) Gauche > staggered > eclipsed

28) On heating aqueous solution of benzene diazonium chloride, which is formed?
A) Phenol
B) Aniline
C) Benzene
D) Chlorobenzene

29) Gradual addition of electronic shells in the noble gases causes a decrease in their
A) atomic radius.
B) ionization energy.
C) boiling point.
D) density.

30) Alcohols of low molecular weight are
A) soluble in all solvents.
B) soluble in water.
C) insoluble in all solvents.
D) soluble in water on heating.

31) _____ is a natural colloid.
A) Blood
B) Urea
C) Sugar
D) NaCl

32) Formic acid
A) reduces the ammoniacal silver nitrate.
B) is immiscible with water.
C) is a weak acid nearly three and a half time weaker than acetic acid.
D) is prepared by heating potassium hydroxide.

33) The polymer used for making contact lenses for eyes is
A) Polyethylene
B) Polymethylmethacrylate
C) Polyethylacrylate
D) Nylon-6

34) Green chemistry reduces the use of _____
A) liquid fuels
B) energy
C) gaseous fuels
D) solid fuels

35) The occurrence of a reaction is impossible if
A) ΔH is + ve; ΔS is - ve.
B) ΔH is - ve; ΔS is + ve.
C) ΔH is - ve; ΔS is also - ve but $\Delta H > T\Delta S$.
D) ΔH is +ve; ΔS is also + ve but $\Delta H < T\Delta S$.

36) Green chemists reduce risk by which of the following?
A) Reducing the hazard inherent in a chemical product or process
B) Minimizing the use of all chemicals
C) Developing recycled products
D) Inventing technologies that will clean up toxic sites

37) Which alkali metals liberates when reacting with acids?
A) Oxygen
B) CO_2
C) Hydrogen
D) Chlorine

38) The pair of compounds in which both the compounds give positive test with Tollen's reagent is
A) glucose and fructose.
B) acetophenone and hexanal.
C) fructose and sucrose.
D) glucose and sucrose.

39) Which functional group participates in disulphide bond formation in proteins?
A) Thiol
B) Thiolactone
C) Thioether
D) Thioester

40) A solution of $CaCl_2$ is 0.5 mol/litre, then find the moles of chloride ions in 500mL.
A) 0.25
B) 0.50
C) 0.75
D) 1.00

41) IUPAC name of $K_3\left[Al(C_2O_4)_3\right]$ is called
A) potassium aluminium (III) trioxalate.
B) potassium alumino oxalato.
C) potassium tris oxalato aluminate (IV).
D) potassium tris oxalato aluminate (III).

42) The half life for the reaction $N_2O_5 \rightarrow 2NO_2 + \frac{1}{2}O_2$ in 24 hrs at 30^oC. Starting with 10 g of N_2O_5, how many grams of N_2O_5 will remain after a period of 96 hours
A) 0.5 g
B) 0.63 g
C) 1.25 g
D) 1.77 g

43) Which is not the correct relation between enthalpy (ΔH) and intrinsic energy (ΔU)?
A) $\Delta U = \Delta H - P\,\Delta V$
B) $\Delta H = \Delta U - P\,\Delta V$
C) $\Delta H = \Delta U + n\,RT$
D) $\Delta H = \Delta U + P\,\Delta V$

44) Which of the following is correct for hormones?
A) They are proteins
B) They are steroids
C) They are amino acid derivatives
D) All of these

45) A compound X of formula C_3H_8O yields a compound C_3H_6O, on oxidation. To which of the following classes of compounds could X being?
A) Aldehyde
B) Secondary alcohol
C) Alkene
D) Tertiary alcohol

46) In solution of $AgNO_3$, if Cu is added solution become blue due to
A) reduction of Cu.
B) reduction of Ag.

C) oxidation of Cu.
D) oxidation of Ag.

47) Which one of the following is a strong field ligand?
A) NH_3
B) en
C) NO_2^-
D) CN^-

48) pH of 0.1 M solution of a weak acid (HA) is 4.50. It is neutralized with NaOH solution to decrease the acid content to half pH of the resulting solution
A) 4.50
B) 7.00
C) 8.00
D) 10.00

49) Bromination of ethane produces
A) HBr
B) ethyl bromide and HBr
C) bromoethene
D) ethyl bromide

50) In presence of $AlCl_3$, benzene and n-propyl bromide react in Friedel-Craft's reaction to form
A) 1, 4-dinormal propyl benzene.
B) isopropyl benzene.
C) 1, 2-dinormal propyl benzene.
D) n-propyl benzene.