Studentpad

K-CET CHEMISTRY PAPER 2022-23

Time : 120 Min	Chem : Full Portion Paper	Marks : 60

01) When excess of electrolyte is added to a colloid, it
A) precipitates.
B) coagulates.
C) gets diluted.
D) does not change.

02) Which one of the following shows maximum paramagnetic character?
A) $\left[Cu(H_2O)_6\right]^{2+}$
B) $\left[Fe(CN)_6\right]^{3-}$
C) $\left[Fe(CN)_6\right]^{4-}$
D) $\left[Cr(H_2O)_6\right]^{3+}$

03) On boiling an aqueous solution of $KClO_3$ with iodine, the following product is obtained.
A) KCl
B) KIO_4
C) $KClO_4$
D) KIO_3

04) The formation of SO_3 takes place according to the following reaction, $2SO_2 + O_2 \rightleftharpoons 2SO_3$; $\Delta H = -45.2$ kcal. The formation of SO_3 is favoured by
A) increasing of pressure.
B) increase of volume.
C) removal of oxygen.
D) increasing in temperature.

05) Will $Fe_{(s)}$ be oxidized to Fe^{2+} by the reaction with 1 M HCl? (E^o for $Fe / Fe^{2+} = +0.44$ V)
A) No
B) Yes
C) Can't say
D) May be

06) Ammonia forms the complex ion $[Cu(NH_3)_4]^{2+}$ with copper ions in alkaline solutions but not in acidic solution. What is the reason for it?
A) Copper hydroxide is an amphoteric substance.
B) In alkaline solutions insoluble $Cu(OH)_2$ is precipitated which is soluble in excess of any alkali.
C) In acidic solutions protons coordinate with ammonia molecules forming NH_4^+ ions and NH_3 molecules are not available.
D) In acidic solutions hydration protects copper ions.

07) Value of gas constant R is
A) 83 erg $mol^{-1}K^{-1}$
B) 8.3 J $mol^{-1}K^{-1}$
C) 0.082 litre atm
D) 0.987 cal $mol^{-1}K^{-1}$

08) The fermentation of starch to give alcohol occurs mainly with the help of
A) enzymes
B) CO_2
C) air
D) O_2

09) 0.2 gm of fine animal charcoal is mixed with half litre of acetic acid solution and shaken for 30 minutes,
A) concentration of the solution decrease.
B) concentration remains same.
C) concentration increases.
D) none of these.

10) When glucose reacts with bromine water, the main product is
A) saccharic acid.
B) acetic acid.
C) gluconic acid.
D) glyceraldehyde.

11) Complete the sentence: In fluorite structure (CaF_2),
A) Ca^{2+} ions form ccp and F^- ions are present in all the octahedral voids
B) Ca^+ ions form ccp and F^- ions are present in all the tetrahedral voids
C) Ca^{2+} ions form ccp and F^- ions are present in all the octahedral voids and half of ions are present in tetrahedral voids
D) None of these

12) Which one of the following is not a base?
A) HN_3
B) $(CH_3)_3N$
C) NH_2OH
D) N_2H_4

13) The only cations present in a slightly acidic solution are Fe^{3+}, Zn^{2+} and Cu^{2+}. The reagent that when added in excess to this solution would identify and separate Fe^{3+} in one step is
A) H_2S gas
B) 6M NaOH

C) 6M NH_3
D) 2M HCl

14) Which compound has the highest boiling point?
A) Ethanol
B) Methanol
C) Diethyl ether
D) Acetone

15) In the crystal of CsCl, the nearest neighbours of each Cs ion are
A) eight Cs ions.
B) eight chloride ions.
C) six Cs ions.
D) six chloride ions.

16) Aldehydes and ketones give addition reaction with
A) hydrogen cyanide.
B) phenyl hydrazine.
C) hydrazine.
D) semicarbazide.

17) Hypo is used in photography because of its
A) reaction with light.
B) complex forming behavior.
C) oxidizing behavior.
D) reducing behavior.

18) In the reaction,
$C_6H_5OH \xrightarrow{NaOH} (A) \xrightarrow[140^\circ C, (4-7\ atm)]{CO_2} (B) \xrightarrow{HCl} (C)$, the compound (C) is
A) salicylic acid.
B) chlorobenzene.
C) salicylaldehyde.
D) benzoic acid.

19) In which of the compounds does hydrogen have an oxidation state of -1?
A) CaH_2
B) HCl
C) NH_3
D) CH_4

20) The pH of 0.05 M solution of dibasic acid is
A) -2
B) +2
C) -1
D) +1

21) Which type of bond is formed between similar atoms?
A) Metallic
B) Coordinate
C) Covalent
D) Ionic

22) The heat evolved in the combustion of methane is given by the following equations:
$CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + H_2O(l); \quad \Delta H = -890.3\ kJ$
How many grams of methane would be required to produce 445.15 kJ of heat of combustion?
A) 16 g
B) 12 g
C) 8 g
D) 4 g

23) IUPAC name of acetyl salicylic acid is
A) m-benzoic acid.
B) p-acetyl benzoic acid.
C) p-benzoic acid.
D) 2-acetoxy benzoic acid.

24) Rate of diffusion of a gas is
A) inversely proportional to the square root of its molecular mass.
B) directly proportional to the square root of its molecular mass.
C) directly proportional to its molecular mass.
D) directly proportional to its density.

25) When H_2S gas is passed through nitric acid, the product is
A) amorphous S.
B) rhombic S.
C) prismatic S.
D) none of these.

26) Which of the following is normally not an atmospheric pollutant
A) Carbon dioxide
B) Carbon monoxide
C) Sulphur dioxide
D) Hydrocarbons

27) The product formed when benzene is nitrated by fuming nitric acid is
A) m-dinitrobenzene.
B) sym-trinitrobenzene.
C) nitrobenzene.
D) none of these.

28) Which of the following statements about chloroform is false?
A) It is highly inflammable.
B) It is a colourless, sweet-smelling liquid.
C) It is almost insoluble in water.
D) It can be used as an inhalational anaesthetic agent.

29) Which of the following statements is true for fuel cells?
A) They run till reactants are active.
B) They are more efficient.
C) They are free from pollution.
D) All of these.

30) What happens, when 2-hydroxy benzoic acid is distilled with zinc dust, it gives
A) benzoic acid.
B) phenol.
C) benzaldehyde.
D) a polymeric compound.

31) A new carbon-carbon bond formation is possible in
A) Cannizzaro reaction.
B) Reimer-Tiemann reaction.
C) Friedel-Craft's alkylation.
D) Both (2) and (3).

32) What is Avogadro number?
A) Number of molecules present in one gram molecular mass of a substance
B) Number of atoms in one gram of element
C) Number of milliliters which one mole of a gaseous substances occupies at NTP
D) All of these

33) Molten sodium is used in nuclear reactors to
A) absorb the heat generated by nuclear fission.
B) extract radio-isotopes produced in the reactor.
C) slow down the fast neutrons.
D) absorb neutrons in order to control the chain reaction.

34) The product formed by the reaction of chlorine with benzaldehyde in the absence of a catalyst is
A) chlorobenzene.
B) benzoyl Chloride.
C) benzyl chloride.
D) o-chlorobenzaldehyde.

35) Which type of bonding exists in Li_2O and CaF_2 respectively?
A) Coordinate, ionic
B) Covalent, ionic
C) Ionic, covalent
D) Ionic, ionic

36) Schweitzer's reagent used for dissolving cellulose in the manufacture of artificial silk, is
A) $CuSO_4 . 5H_2O$
B) $[Cu(NH_3)_4]SO_4$
C) CuI
D) $Cu(CH_3COO)_2 . Cu(OH)_2$

37) The rate of a gaseous reaction is given by the expression $K[A][B]$. If the volume of the reaction vessel is suddenly reduced to 1/4th of the initial volume, the reaction rate relating to original rate will be
A) 16
B) 8
C) 1/10
D) 1/8

38) 25 ml of a solution of barium hydroxide on titration with a 0.1 molar solution of hydrochloric acid gave a litre value of 35 ml. The molarity of barium hydroxide solution was
A) 0.35
B) 0.28
C) 0.14
D) 0.07

39) Nitrogen forms how many oxides?
A) 6
B) 5
C) 4
D) 3

40) Which of the following compounds of elements in group IV would you expect to be most ionic in character?
A) $PbCl_4$
B) $PbCl_2$
C) $SiCl_4$
D) CCl_4

41) F_2 is the formed by reacting K_2MnF_6 with
A) MnF_4
B) $KSbF_6$
C) MnF_3
D) SbF_5

42) For the redox reaction $Zn_{(s)} + Cu^{2+}(0.1M) \rightarrow Zn^{2+}(1M) + Cu_{(s)}$ taking place in a cell, E^{o}_{cell} is 1.10 volt. E_{cell} for the cell will be $\left(2.303\frac{RT}{F} = 0.0591\right)$
A) 0.82 V
B) 1.07 V
C) 1.80 V
D) 2.14 V

43) Which of the following pairs has elements containing same number of electrons in the outermost orbit?
A) $Cl - Br$
B) $Ca - Cl$
C) $Na - Cl$
D) $N - O$

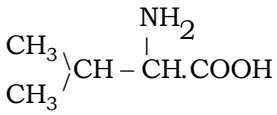
44) 'Oil of mirbane' is
A) Aniline.
B) p-nitroaniline.
C) Nitrobenzene.
D) p-aminoazobenzene.

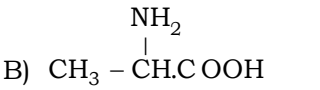
45) For the reaction $2N_2O_5 \rightarrow 4NO_2 + O_2$, rate of reaction and rate constant are 1.02×10^{-4} and $3.4 \times 10^{-5}\ s^{-1}$ respectively. The concentration of N_2O_5 at that time will be
A) 3.4×10^{5}
B) 1.02×10^{-4}
C) 3
D) 1.732

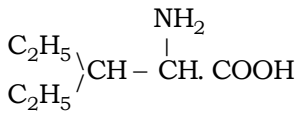
46) What amount of bromine will be required to convert 2 g of phenol into 2, 4, 6-tribromophenol?
A) 20.44
B) 10.22
C) 6.00
D) 4.00

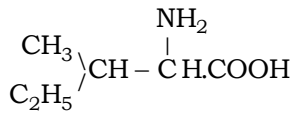
47) The rate at which a substance reacts depends on its
A) active mass.
B) molecular weight.
C) atomic weight.
D) equivalent weight.

48) The structural formula of an amino acid, isoleucine is

A) 

B) 

C) 

D) 

49) For a chemical reaction, ____ can never be a fraction.
A) molecularity
B) order
C) half-life
D) rate constant

50) Which quantum number is not related with Schrodinger equation?
A) Spin
B) Magnetic
C) Azimuthal
D) Principal

51) Which one of the following statements shows the correct percentage of carbon in steel, pig iron and wrought iron?
A) Wrought iron less than 0.15% carbon; pig iron 0.15 to 2.0% carbon; and steel over 2.0% carbon.
B) Wrought iron less than 0.15% carbon; steel 0.15 to 2.0% carbon; and pig iron over 2% carbon.
C) Pig iron less than 0.15% carbon; wrought iron 0.15 to 2.0% carbon; and steel over 2% carbon.
D) Steel containing less than 0.15% carbon; wrought iron 0.15 to 2.0% carbon; and pig iron over 2% carbon.

52) When ethyl alcohol (C_2H_5OH) reacts with thionyl chloride, in the presence of pyridine, the product obtained is
A) $CH_3CH_2Cl + HCl + SO_2$
B) $CH_3CH_2Cl + H_2O + SO_2$
C) $C_2H_5Cl + Cl_2 + SO_2$
D) $CH_3CH_2Cl + HCl$

53) The products formed in the following reaction $C_6H_5 - O - CH_3 + HI \xrightarrow{heat}$ are
A) C_6H_5 - OH and CH_3 - I
B) C_6H_5 - I and CH_3 - OH
C) C_6H_5 and CH_3OI
D) C_6H_5 - CH_3 and HOI

54) In acidic medium, equivalent weight of $K_2Cr_2O_7$ $(mol.\ wt. = M)$ is
A) $M/2$
B) $M/3$
C) $M/4$
D) $M/6$

55) What is the magnetic moment of $K_3[FeF_6]$?
A) 6.92 BM
B) 5.91 BM
C) 4.89 BM
D) 3.87 BM

56) The correct order of bond angles (smallest first) in H_2S, NH_3, BF_3 and SiH_4 is
A) $H_2S < SiH_4 < NH_3 < BF_3$
B) $H_2S < NH_3 < BF_3 < SiH_4$
C) $H_2S < NH_3 < SiH_4 < BF_3$
D) $NH_3 < H_2S < SiH_4 < BF_3$

57) Tetragonal crystal system has the following unit cell dimensions
A) $a = b \neq c$ and $\alpha = \beta = 90^o, \gamma = 120^o$
B) $a \neq b \neq c$ and $\alpha = \beta = \gamma = 90^o$
C) $a = b \neq c$ and $\alpha = \beta = \gamma = 90^o$
D) $a = b = c$ and $\alpha = \beta = \gamma = 90^o$

58) $CH_2 = CH_2 \xrightarrow{Br_2/H_2O} A,$
In the above reaction the compound A is
A) 1, 2-dibromo ethane.
B) ethylene bromohydrin.
C) ethanol.
D) none of these.

59) Aldehyde and ketones can decolourize by
A) quick lime.
B) bromine water.
C) dil. H_2SO_4 .
D) none of these.

60) If acetylene is passed through an electric arc in the atmosphere of nitrogen, the compound formed is
A) pyridine.
B) pyrazole.
C) pyrrole.
D) HCN.