Class: XII

Subject: Chemistry

SECTION A

1. Which of the following is a network solid?

(a) SiO_2

(b) I_2

(c) SO_2 (solid)

(d)H_2O (ice)

2. In 1962, Neil Bartlett prepared a red colored compound of Xe. It was

(a) $Xe^+[PdF_6]^-$

(b) $Xe^+[PtF_5]^-$

(c) $Xe^+[PtF_6]^-$

(d) $Xe_2^+[PtF_6]^-$

3. People taking lot of salt experience puffiness or swelling of the body due to:

(a) Water loss from the cells due to osmosis.

(b) Water retention in tissue cells and intercellular spaces because of osmosis.

(c) Capillary action of water through skin pores.

(d) Excessive thirst and drinking more water.

4.The crystal system of a compound with unit cell dimensions, a=0.387 nm, b=0.432 nm and c=0.504 nm and $\alpha = \beta = \gamma = 90^o$

(a) cubic

(b) hexagonal

(c) orthorhombic

(d) rhombohedral

5. In dehydrohalogenation reactions, the preferred product is that alkene which has the greater number of alkyl groups attached to the doubly bonded carbon atoms. This rule is known as:

(a) Saytzeff's rule
(b) Peroxide rule
(c) Markovnikov's rule
(d) Hoffmann rule

6.The two cyclic hemiacetal forms of glucose differ only in the configuration of the hydroxyl group at C1(the aldehyde carbon before cyclisation). α-form and β-form of glucose are called ----------

(a) Stereoisomers
(b) Structural isomers
(c) Anomers
(d) Epimers

7. Which of the following compounds has the lowest boiling point:

(a) Chloropropane
(b) Chlorobutane
(c) 1-Chloro-2-methylpropane
(d) 2-Chloro-2-methylpropane

8. Which of the compounds will act as strongest reducing agent?

(a) NH_3
(b) BiH_3
(c) AsH_3
(d) PH_3

9.The order of reactivity of alcohols with Lucas reagent follows order:

(a) 1° > 2 °> 3 °

(b)2° > 1° > 3°

(c)3° > 1° > 2°

(d)3° > 2° > 1°

10. Which one of the following will show same value for electrical resistance and refractive index along any direction?

(a) Naphthalene

(b) Graphite

(c) Glass

(d) Common Salt

11. Which among the following has least pKa value

(a) o-cresol

(b) m-nitrophenol

(c) p-nitrophenol

(d)Phenol

12. Which of the following concentration terms is not affected by temperature?

(a) molality

(b) molarity

(c) normality

(d) w/v%

13.Phenol reacts with dil nitric acid and yields a mixture of o- and p- nitrophenol. o- nitrophenol is steam volatile, while p- nitrophenol is less volatile, due to

(a) Intramolecular H- bonding in o- nitrophenol, while intermolecular H- bonding in p- nitrophenol.

(b) Intramolecular H- bonding in p- nitrophenol, while intermolecular H- bonding in o- nitrophenol.

(c) Weak Van der Waals force in o- nitrophenol.

(d) Weak Van der Waals force in p- nitrophenol.

14. Hot conc. H_2SO_4 acts as moderately strong oxidizing agent. It oxidizes both metals and non-metals. Which of the following element is oxidized by conc. H_2SO_4 into two gaseous products?

(a) Cu

(b) S

(c) C

(d) Zn

15. Which of the following reactions of glucose can be explained only by its cyclic structure?

(a) Glucose forms pentaacetate.

(b) Glucose reacts with hydroxylamine to form an oxime.

(c) Pentaacetate of glucose does not react with hydroxylamine.

(d) Glucose is oxidized by nitric acid to gluconic acid.

16. Which of the following is most reactive towards SN_1 reaction?

(a) $C_6H_5C(CH_3)(C_6H_5)Br$

(b) $C_6H_5CH_2Br$

(c) $C_6H_5CH(C_6H_5)Br$

(d) $C_6H_5CH(CH_3)Br$

17.Identiy the tertiary alcohol among the following:

(a) $CH_3C(CH_3)_2CH_2OH$

(b) $CH_2=CHCH_2CH_2OH$

(c) $C_6H_5CH_2CH(OH)CH_3$

(d) $C_6H_5CH=CHC(CH_3)_2OH$

18.Axial Br-F bonds are slightly bent in the structure of BrF_3.It is due to

(a) BrF_3 is an interhalogen compound.

(b)F is highly electronegative.

(c) Equatorial lone pair -lone pair repulsions

(d) Equatorial bond pair -lone pair repulsions

19.A compound formed by elements P and Q crystallizes in a cubic structure where P atoms are at the corners of a cube and Q atoms are at the face centers. The formula of the compound is:

(a) P_2Q_2

(b) PQ_3

(c) PQ

(d) P_3Q

20.Which of the following hydrogen halides is most volatile?

(a) HF

(b) HCl

(c) HBr

(d) HI

21. A nucleotide of DNA on hydrolysis will give:

(a) deoxyribose sugar, phosphate group and a nitrogen-containing base adenine (A) /cytosine (C) / guanine (G) / thymine (T).

(b) ribose sugar, phosphate group and a nitrogen-containing base adenine (A) /cytosine (C) / guanine (G) / thymine (T).

(c) deoxyribose sugar, phosphate group and a nitrogen-containing base adenine (A) /cytosine (C) / guanine (G) / uracil(U).

(d) deoxyribose sugar, phosphate group and a nitrogen-containing base adenine (A) /cytosine (C) / glycine (G) / thymine (T).

22.When two different halogens react with each other, interhalogen compounds are formed.

Which statement is incorrect about interhalogen compounds?

(a) These are all covalent molecules.

(b) They are diamagnetic in nature.

(c) They are more reactive than halogens except fluorine.

(d) X-X' bond in interhalogens is stronger than X-X bond.

23.An organic compound with molecular formula C_6H_6O reacts with bromine water and gives a white precipitate. The IUPAC name of the product is:

(a) 2-bromophenol

(b) 4-bromophenol

(c) 2-bromohexanol

(d) 2,4,6-Tribromophenol

24.Tungsten crystallizes in bcc unit cell. If the edge of the unit cell is 316.5pm, what is the radius of tungsten atom?

(a) 135pm

(b) 13.704pm

(c) 137.04pm

(d) 111.91pm

25. An ethanol–water mixture (obtained by fermentation of sugars) on fractional distillation yields a solution containing almost 95% by volume of ethanol. What is incorrect about the above mentioned azeotrope?

(a) It is a constant boiling mixture.

(b) Their composition is unchanged by simple distillation

(c) When the above azeotrope is boiled, the vapour has the different proportions of constituents as the unboiled mixture.

(d) It shows greater positive deviation from Raoult's law.

26. An element with molar mass 27 g mol^{-1} forms a cubic unit cell with edge length 300 pm. If its density is 6.6gcm^{-3}, the nature of cubic unit cell is

(a) simple

(b) bcc

(c) fcc

(d) end centred

27. Which of the following is not an allylic halide?

(a) 4-Bromopent-2-ene

(b) 3-Bromo-2-methylbut-1-ene

(c) 1-Bromobut-2-ene

(d) 4-Bromobut-1-ene

28.Nitrogen is unable to form pentahalides because of:

(a) Triple covalent bond is present between two nitrogen atoms.

(b) The absence of d orbitals.

(c) Nitrogen has half-filled p orbital.

(d) The presence of s and p orbitals.

29. Which reagent is required for one step conversion of chlorobenzene to phenol?

(a) $NaOH/H^+$, 623K, 300 atm

(b) $NaOH/H^+$, 443K

(c) $KOH(alc)/ H^+$

(d) Warm/water

30.An organic compound (A) having molecular formula C_6H_6O gives a characteristic colour with aqueous $FeCl_3$ solution. (A) on treatment with CO_2 and NaOH at 400 K under pressure gives (B), which on acidification gives a compound (C). The compound (C) reacts with acetyl chloride to give (D) which is a popular pain killer.
Compound (A) and (D)are

(a) Cyclohexanol and Benzoic acid

(b) Phenol and 2-Acetoxybenzoic acid

(c) Phenol and 4-Hydroxybenzoic acid

(d) Salicylic acid and 4-Hydroxybenzoic acid

31.when an element A is burnt in air, it gives a colorless gas B which is used for bleaching wool and silk. The gas is:

(a) CO_2

(b) SO_3

(c) NO_2

(d) SO_2

32.Alkali metal halides are colored due to:

(a) metal deficiency defect.

(b) metal excess defect due to the presence of extra cations at interstitial sites.

(c) Impurity defects.

(d) metal excess defect due to anionic vacancies.

33.An alkyl halide, RX reacts with KCN to give propane nitrile. RX is:

(a) C_3H_7Br

(b) C_4H_9Br

(c) C_2H_5Br

(d) C_2H_4Br

34.Which one of the following is correct:

(a) $XeOF_4$: Square pyramidal, XeO_3: Pyramidal, XeF_4: Square planar

(b) ClF_3: Bent T shaped, BrF_5: square pyramidal, IF_3: Pyramidal

(c) XeF_2: Linear, XeO_3: Trigonal planar, $XeOF_4$: Square pyramidal

(d) XeF_6: Octahedral, XeF_2: Linear, XeF_4: Tetrahedral

35. 18g of glucose is dissolved in 1kg of water. At what temperature will water boil at 1.013bar? K_b for water is 0.52K kg mol^{-1}

(a) 373.15K

(b) 0.052K

(c) 373.202K

(d) 100.202K

36.Which among the given α amino acids is optically inactive?

(a) Alanine

(b) Valine

(c) Glycine

(d) Leucine

37. When MnO_2 is heated with conc HCl, a pungent colored gas (A) is evolved. (A) reacts with excess of NH_3 to give a colorless gas (B). However, when excess (A) is reacted with NH_3 it gives an explosive (C). (A), (B) and (C) respectively are

(a) Cl_2, N_2, NH_4Cl

(b) Cl_2, N_2, NCl_3

(c) $MnCl_2$, NH_4Cl, NCl_3

(d) $MnCl_2$, N_2, NCl_3

38. The unit of ebullioscopic constant is

(a) K kg mol^{-1}

(b) mol kg K^{-1}

(c) kg mol^{-1} K^{-1}

(d) K mol kg

39. The correct order of hydrides of the 15th group in decreasing order of boiling point is:

(a) $NH_3 > PH_3 > AsH_3 > SbH_3 > BiH_3$

(b) $NH_3 < PH_3 < AsH_3 < SbH_3 < BiH_3$

(c) $BiH_3 > SbH_3 > NH_3 > AsH_3 > PH_3$

(d) $NH_3 > BiH_3 > SbH_3 > AsH_3 > PH_3$

40. The product formed in a reaction is 2-Methylpropan-2-ol. For the reaction the reactants are:

(a) Propanal and methyl magnesium bromide

(b) Propanone and methyl magnesium bromide

(c) Ethanal and ethyl magnesium bromide

(d) Propanone and ethyl magnesium bromide

41. Which of the following is the correct order of increasing boiling points:

(a) Pentan-1-ol >Butan-1-ol >Ethoxyethane> Butane

(b) Ethoxyethane < Butane < Pentan-1-ol <Butan-1-ol

(c) Ethoxyethane < Butane < Butan-1-ol < Pentan-1-ol

(d) Butane < Ethoxyethane < Butan-1-ol < Pentan-1-ol

42.Among the oxoacids of Cl which one is the strongest acid:

(a) HOCl

(b) $HClO_4$

(c) $HClO_3$

(d) $HClO_2$

43.Anisole undergoes Friedal-Crafts acylation reaction. The major product is

(a) 2-Methoxyacetophenone

(b) 4-Methoxyacetophenone

(c) 2-Methoxytoluene

(d) 4-Methoxytoluene

44. An Organic compound with molecular formula C_6H_7N reacts with $NaNO_2$ + HCl/273 – 278K give 'X'. X on reaction with cuprous chloride gives 'Y'. Identify 'X' and 'Y'.

(a) X – Hexanamine Y – Chlorohexane

(b) X – Nitrobenzene Y – 1,2 – dichlorobenzene

(c) X – Benzene diazoniumhalide Y- Chlorobenzene

(d) X- Benzylchloride Y- Toluene

45. Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion (A): S_N2 reaction proceeds with inversion of configuration while S_N1 reactions are accompanied by racemization.

Reason (R): S_N2 takes place in single step while S_N1 occurs in two steps.

Select the most appropriate answer from the options given below:

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true but R is not the correct explanation of A.

(c)A is true but R is false.

(d) A is false but R is true.

46. Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion(A): Partial hydrolysis of XeF_6 gives oxyfluorides.

Reason(R): Hydrolysis of XeF_6 is a redox reaction.

Select the most appropriate answer from the options given below:

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true but R is not the correct explanation of A.

(c)A is true but R is false.

(d) A is false but R is true.

47. Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion(A): A mixture of chloroform and acetone forms a solution with positive deviation from Raoult's law.

Reason(R): Chloroform molecule forms hydrogen bond with acetone molecule.

Select the most appropriate answer from the options given below:

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true but R is not the correct explanation of A.

(c)A is true but R is false.

(d) A is false but R is true.

48. Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion(A): Iron on reaction with HCl gives $FeCl_2$ and not $FeCl_3$.

Reason(R): Hydrogen gas produced during the reaction prevents the formation of $FeCl_3$.

Select the most appropriate answer from the options given below:

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true but R is not the correct explanation of A.

(c)A is true but R is false.

(d) A is false but R is true.

49. Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion(A): When urea is dissolved in water, the boiling point of water is lowered.

Reason(R): The vapour pressure of the solvent decreases in the presence of non – volatile solute.

Select the most appropriate answer from the options given below:

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true but R is not the correct explanation of A.

(c)A is true but R is false.

(d) A is false but R is true.

SECTION C

This section consists of 6multiple choice questions with an overall choice to attempt any5. In case more than desirable number of questions are attempted, ONLY first 5 will be considered for evaluation.

50 Match the following

I	II
(i) Maltose	(A) Coagulation of egg
(ii) Myosin	(B) DNA
(iii) Denaturation	(C) Reducing sugar
(iv) Nucleotide	(D) Proteins
(v) Peptide bond	

Which of the following is the best matched option?

(a) i)-D, ii)- C, iii)-A, iv)- B

(b) i)-B, ii)- C, iv)-D, iii)- A

(c) i)- C, ii)- D, iii)- A, iv)- B

(d) i)- B, iii)- D, iv)- C, v)- D,

51 Which of the following analogies is correct:

(a) NH_3 – Lewis base : PH_3 - Lewis acid

(b) Noble gases – Maximum negative electron gain enthalpy : Halogens - Maximum positive electron gain enthalpy.

(c) BrF_3 – Trigonal planar: XeO_3 – Pyramidal

(d) He – Filling balloons: Ne -In discharge tubes

52 Complete the following analogy:
Mixture of two enantiomers in equal proportion, have zero optical rotation – A
Isomers which rotate the plane polarized light – B(identify A and B)

(a) A-Inversion B- Stereoisomers

(b) A-Racemic modification B – Optical isomers

(c) A-Retention B- Geometrical isomers

(d) A-Stereoisomers B- racemic modification