

Sample Question Paper – 2 (TERM - I)

Class XII (Session - 2021-22)

Subject- Chemistry

Time: 90 Minutes

Maximum Marks: 45

General Instructions:

- 1 The Question Paper contains three sections.
- 2 Section A has 25 questions. Attempt any 20 questions.
- 3 Section B has 24 questions. Attempt any 20 questions.
- 4 Section C has 6 questions. Attempt any 10 questions.
- 5 All questions carry equal marks.
- 6 There is no negative marking.

Section A

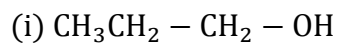
Q1: Which of the following can be used to describe a crystalline solid?

- (a) Heterogeneous, anisotropic
- (b) Homogeneous, anisotropic
- (c) Heterogeneous, isotropic
- (d) Homogeneous, isotropic

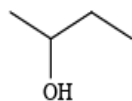
Q2: The increase in the Temperature of the aqueous solution will result in its

- (a) Molarity to increase
- (b) Molarity to decrease
- (c) Mole fraction to increase
- (d) Mass % to increase

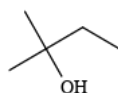
Q3: The order of reactivity of following alcohols with halogen acids is:



(ii)



(iii)



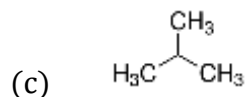
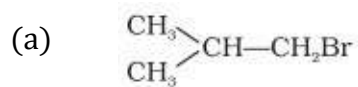
(a) (i) > (ii) > (iii)

(b) (iii) > (ii) > (i)

(c) (ii) > (i) > (iii)

(d) (i) > (iii) > (ii)

Q4: Arrange the following compounds in increasing order of their boiling points.



(a) (c) < (a) < (b)

(b) (c) < (b) < (a)

(c) (a) < (b) < (c)

(d) (b) < (a) < (c)

Q5: Arrange the following compounds in increasing order of boiling point.:

Propan-1-ol, butan-1-ol, butan-2-ol, pentan-1-ol

(a) Propan-1-ol, butan-2-ol, butan-1-ol, pentan-1ol

(b) Propan-1-ol, butan-1-ol, butan-2-ol, pentan-1ol

(c) Pentan-1-ol, butan-2-ol, butan-1-ol, propan-1ol

(d) Pentan-1-ol, butan-1-ol, butan-2-ol, propan-1ol

Q6: Amino acids are:

- (a) Acidic
- (b) Basic
- (c) Amphoteric
- (d) Neutral

Q7: _____ is the basic repeated structural unit of a crystalline solid.

- (a) Monomer
- (b) Molecule
- (c) Unit cell
- (d) Atom

Q8: A beaker contains a solution of substance A. Precipitation of substance 'A' takes place when small amount of A is added to the solution. The solution is.....

- (a) saturated
- (b) supersaturated
- (c) unsaturated
- (d) concentrated

Q9: Bond dissociation enthalpy of E – H (E = element) bond is given below. Which of the compounds will act as strongest reducing agent?

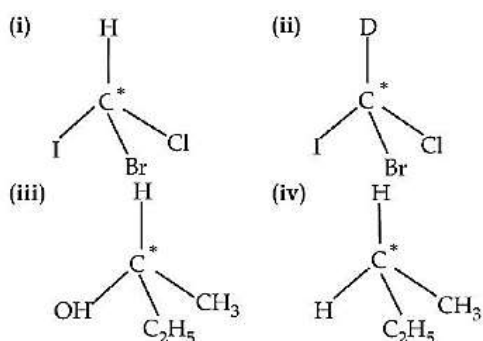
Compound	NH ₃	PH ₃	AsH ₃	SbH ₃
$\Delta_{\text{diss}}(\text{E} - \text{H})/\text{kJmol}^{-1}$	389	322	297	255

- (a) NH₃
- (b) PH₃
- (c) AsH₃
- (d) SbH₃

Q10: Which of the following alkyl halides will undergo S_N¹ reaction most readily?

- (a) (CH₃)₃C – F
- (b) (CH₃)₃C – Cl
- (c) (CH₃)₃C – Br
- (d) (CH₃)₃C – I

Q11: In which of the following molecules carbon atom marked with asterisk (*) is asymmetric?



(a) (i), (ii), (iii), (iv)

(b) (i), (ii), (iii)

(c) (ii), (iii), (iv)

(d) (i), (iii), (iv)

Q12: Proteins are found to have two different types of secondary structures, viz. α -helix and β -pleated sheet structure. α -helix structure of protein is stabilised by:

(a) Peptide bonds

(b) van der Waals forces

(c) Hydrogen bonds

(d) Dipole-dipole interactions

Q13: The points which shows the position of atoms in crystal are called as _____

(a) crystal lattice

(b) crystal parameters

(c) bravais lattice

(d) lattice point

Q14: For a dilute solution, Raoult's law states that

(a) The lowering of vapour pressure is equal to the mole fraction of solute.

(b) The relative lowering of vapour pressure is equal to the mole fraction of solute.

(c) The relative lowering of vapour pressure is proportional to the amount of solute in solution.

(d) The vapour pressure of the solution is equal to the mole fraction of the solute.

Q15: Which of the following is not tetrahedral in shape?

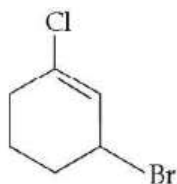
(a) NH_4^+

(b) SiCl_4

(c) SF_4

(d) SO_4^{2-}

Q16: The IUPAC name of the compound shown below is:



- (a) 2-bromo-6-chlorocyclohex-1-ene
- (b) 6-bromo-2-chlorocyclohexene
- (c) 3-bromo-1-chlorocyclohexene
- (d) 1-bromo-3-chlorocyclohexene

Q17: 1-Propanol and 2-propanol can be best distinguished by

- (a) Oxidation with KMnO_4 followed by reaction with Fehling solution?
- (b) Oxidation with acidic dichromate followed by reaction with Fehling solution.
- (c) Oxidation by heating with copper followed by reaction with Fehling solution.
- (d) Oxidation with cone. H_2SO_4 followed by reaction with Fehling solution.

Q18: Which one is the complementary base of cytosine in one strand to that in other strand of DNA?

- (a) Adenine
- (b) Guanine
- (c) Thymine
- (d) Uracil

Q19: What is the coordination number of a body-centered unit cell?

- (a) 6
- (b) 12
- (c) 8
- (d) 4

Q20: The mass of $(\text{COOH})_2 \cdot 2\text{H}_2\text{O}$ needed to prepare 500 ml 0.1 N solution is

- (a) 0.315 gm
- (b) 6.3 gm
- (c) 3.15 gm
- (d) 63.0 gm

Q21: Chlorine acts as a bleaching agent only in presence of:

- (a) Sunlight
- (b) Moisture
- (c) Dry air
- (d) Pure oxygen

Q22: Among the following, the most reactive towards alcoholic KOH is :

- (a) $\text{CH}_2 = \text{CHBr}$
- (b) $\text{CH}_3\text{COCH}_2\text{CH}_2\text{Br}$
- (c) $\text{CH}_3\text{CH}_2\text{Br}$
- (d) $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$

Q23: Lucas test is used for the detection of

- (a) alcohols
- (b) alkyl halides
- (c) phenols
- (d) aldehydes

Q24: Which of the following gives positive Fehling solution test?

- (a) Protein
- (b) Sucrose
- (c) Glucose
- (d) Fats

Q25: The correct order of increasing oxidising power is :

- (a) $\text{Cl}_2 < \text{Br}_2 < \text{F}_2 < \text{I}_2$
- (b) $\text{F}_2 < \text{Br}_2 < \text{Cl}_2 < \text{I}_2$
- (c) $\text{F}_2 > \text{Br}_2 > \text{Cl}_2 > \text{I}_2$
- (d) $\text{I}_2 < \text{Br}_2 < \text{Cl}_2 < \text{F}_2$

SECTION B

Q26: An AB_2 type structure is found in

- (a) NaCl
- (b) CaF_2
- (c) Al_2O_3
- (d) N_2O

Q27: 12 g of urea is dissolved in 1 litre of water and 68.4 g of sucrose is dissolved in 1 litre of water. The lowering of vapour pressure of first case is

- (a) equal to second
- (b) greater than second
- (c) less than second
- (d) double that of second

Q28: Which of the following is a disaccharide?

- (a) Lactose
- (b) Starch
- (c) Cellulose
- (d) Fructose

Q29: Which of the following statements is not correct for nitrogen?

- (a) Its electronegativity is very high
- (b) d-orbitals are available for bonding
- (c) It is a typical non-metal
- (d) Its molecular size is small

Q30: Methyl bromide is converted into ethane by heating it in ether medium with_____.

- (a) Na
- (b) Al
- (c) Cu
- (d) Zn

Q31: Which among the following noble gases does not form clathrates?

- (a) Argon
- (b) Xenon
- (c) Krypton
- (d) Helium

Q32: Hydrolysis of starch yields

- (a) sucrose
- (b) fructose
- (c) gluconic acid
- (d) glucose

Q33: Butane-2-ol is

- (a) primary alcohol
- (b) secondary alcohol
- (c) tertiary alcohol
- (d) aldehyde

Q34: The use of pressure cooker reduces cooking time because it creates

- (a) High pressure
- (b) Low pressure
- (c) Low temperature
- (d) High temperature

Q35: Which of the following is the strongest Lewis base?

- (a) NF_3
- (b) NCl_3
- (c) NBr_3
- (d) NI_3

Q36: Among the following which one can have a meso form?

- (a) $\text{CH}_3\text{CH}(\text{OH})\text{CH}(\text{Cl})\text{C}_2\text{H}_5$
- (b) $\text{CH}_3\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}_3$
- (c) $\text{C}_2\text{H}_5\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}_3$
- (d) $\text{HOCH}_2\text{CH}(\text{Cl})\text{CH}_3$

Q37: Coordination numbers of Zn^{2+} and S^{2-} in the crystal structure of wurtzite are

- (a) 4,4
- (b) 6,6
- (c) 8,4
- (d) 8,8

Q38: Ethyl alcohol can be prepared from Grignard reagent by the reaction of :

- (a) HCHO
- (b) R_2CO
- (c) RCN
- (d) RCOCl

Q39: Gold has a face centred cubic lattice with an edge length of the unit cube of 407pm.

Assuming the closest packing, the diameter of the gold atom is

- (a) 576.6pm
- (b) 287.8pm
- (c) 352.5pm
- (d) 704.9pm

Q40: Pure benzene freezes at 5.45°C. A 0.374 m solution of tetrachloroethane in benzene freezes at 3.55°C. The K_f for benzene is:

- (a) 0.508
- (b) 5.08
- (c) 50.8
- (d) 508

Q41: The tribasic acid is :

- (a) H_3PO_4
- (b) H_3PO_3
- (c) H_3PO_2
- (d) HPO_3

Q42: Isopropyl alcohol is obtained by reacting which of the following alkenes with concentrated

H_2SO_4 followed by boiling with H_2O ?

- (a) Ethylene
- (b) Propylene
- (c) 2-Methylpropene
- (d) Isoprene

Q43: Among the 15th group elements, as we move from nitrogen to bismuth, the pentavalency becomes less pronounced and trivalency becomes more pronounced due to

- (a) Non-metallic character
- (b) Inert pair effect
- (c) High electronegativity
- (d) Large ionization energy

Q44: A carbohydrate that cannot be hydrolysed into simpler units is called

- (a) polysaccharides
- (b) trisaccharides
- (c) disaccharides
- (d) monosaccharides.

Q45: Assertion: PbI_4 is not known probably because of the oxidising power of Pb(IV) and reducing power of I^- .

Reason: Iodide stabilizes higher oxidation state.

- (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.

Q46: Assertion : Bond angle of H_2S is smaller than H_2O .

Reason : Electronegativity of the central atom increases, bond angle decreases.

- (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.

Q47: Assertion: The long protein chain folds upon itself like a hollow ball giving rise to the tertiary structure.

Reason : Tertiary structure gives a 3-dimensional view of a protein.

- (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.

Q48: Assertion: Sulphur has greater tendency for catenation than oxygen

Reason: $\text{O}-\text{O}$ bond is weaker than $\text{S}-\text{S}$ bond.

- (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.

Q49: Assertion : Due to Frenkel defect, there is no effect on the density of the crystalline solid.

Reason : In Frenkel defect, no cation or anion leaves the crystal.

- (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

Q50: 0.450 g of urea (mol.wt.60) in 22.5 g of water show 0.170°C of elevation in boiling point.

The molal elevation constant of water is:

- (a) 0.051°C
- (b) 0.51°C
- (c) 5.1°C
- (d) 0.83°C

Q51: Which of the following gives positive Fehling solution test?

- (a) Protein
- (b) Sucrose
- (c) Glucose
- (d) Fats

Q52: Williamson's synthesis is used for the preparation of

- (a) aldehydes
- (b) ethers
- (c) alkyl halides
- (d) alcohols

Question No. 53 to 55 are based on the given text.

Read the text carefully and answer the questions:

Interhalogen compounds are formed when halogen group elements react with each other. These are the compounds which consist of two or more different elements of group-17. A halogen with large size and low electronegativity reacts with an element of group-17 with small size and high electronegativity. As the ratio of radius of larger and smaller halogen increases, the number of atoms in a molecule also increases. The following questions are multiple choice questions. Choose the most appropriate answer :

Q53: Identify the correct match from the following.

- (a) $[\text{ICl}_2]^-$ – bent
- (b) IF_7 - pentagonal bipyramidal
- (c) ClF_3 - trigonal planar
- (d) $[\text{BrF}_4]^-$ –square pyramidal

Q54: In XA_5 , the central atom has (both X and A are halogens),

- (a) 5 bond pairs and no lone pairs
- (b) 5 bond pairs and one lone pair
- (c) 6 bond pairs and no lone pairs
- (d) 4 bond pairs and one lone pair.

Q55: In the known interhalogen compounds, the maximum number of atoms are

- (a) 4
- (b) 5
- (c) 8
- (d) 7