

Sample Question Paper - 1 (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 5 questions.
- 5 All questions carry equal marks.
- 6 There is no negative marking.

Section A

Q1: What type of interaction hold the molecules together in a polar molecular solid?

- (a) London forces
- (b) Hydrogen bonding
- (c) Dipole - dipole interaction
- (d) Metallic bonding

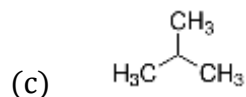
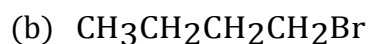
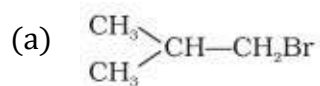
Q2: Solubility of gas decreases with

- (a) Increase in pressure
- (b) Decrease in pressure
- (c) Increase in temperature
- (d) Decrease in temperature

Q3: Which gas is evolved when urea is treated with NaOH?

- (a) Nitrogen
- (b) Ammonia
- (c) Nitrous oxide
- (d) Laughing gas

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: Which of the following reagents can be used to oxidise primary alcohols to aldehydes?

- (a) All of these
(b) CrO_3 in an anhydrous medium.
(c) Heat in the presence of Cu at 573K.
(d) Pyridinium chlorochromate.

Q6: In aqueous solution, amino acids behave like:

- (a) Carboxylic acids
(b) Amines
(c) Base
(d) Salts

Q7: A metal has a body centered cubic crystal structure. The density of the metal is 5.96 g/cm^3 . Find the volume of the unit cell if atomic mass of metal is 50.

- (a) 16.77
(b) $2.786 \times 10^{-23} \text{ cm}^3$
(c) $1.39 \times 10^{-23} \text{ cm}^3$
(d) $5.572 \times 10^{-23} \text{ cm}^3$

Q8: The plant cell will shrink when placed in:

- (a) A hypertonic solution
(b) Water
(c) An isotonic solution
(d) A hypotonic solution

Q9: Which step mentioned below is not considered as fundamental step for the production of nitric acid?

- (a) Oxidation of NH_3 to NO
- (b) Oxidation of NO to NO_2
- (c) Oxidation of NH_3 to NO_2
- (d) Absorption of NO_2 in water

Q10: Which of the following is/are optically active compound/s?

- (a) Secondary butyl chloride
- (b) n-butyl bromide
- (c) tert-butyl chloride
- (d) iso-butyl iodide

Q11: Chloromethane on treatment with excess of ammonia yields mainly

- (a) Methanamine (CH_3NH_2)
- (b) Mixture containing all these in equal proportion
- (c) N-methylmethanamine ($\text{CH}_3\text{—NH—CH}_3$)
- (d) N, N-Dimethylmethanamine $(\text{CH}_3\text{—N} \begin{array}{l} \text{CH}_3 \\ \text{CH}_3 \end{array})$

Q12: The most appropriate structure for knowing about the sequence of nucleotides in the DNA chain is

- (a) tertiary structure
- (b) quaternary structure
- (c) secondary structure
- (d) primary structure

Q13: __ is not an example of amorphous solids.

- (A) Plastic
- (B) Coke
- (C) Glass
- (D) Quartz

Q14: For ideal solution the enthalpy of mixing of the pure components to form the solution is

- (a) None of these
- (b) $\Delta H_{\text{mix}} = +ve$
- (c) $\Delta H_{\text{mix}} = 0$
- (d) $\Delta H_{\text{mix}} - ve$

Q15: Name the gas whose formula was established by Sorret.

- (a) Nitrous oxide
- (b) Oxygen
- (c) Ozone
- (d) Nitric oxide

Q16: Which of the following is an example of vic-dihalide?

- (a) 1,2-dichloroethane
- (b) Dichloromethane
- (c) Ethylidene chloride
- (d) Allyl chloride

Q17: One of the following is not a dihydroxy derivative of benzene.

- (a) Catechol
- (b) Phenol
- (c) Resorcinol
- (d) Quinol

Q18: Which of the following polymer is stored in the liver of animals?

- (a) Glycogen
- (b) Amylopectin
- (c) Amylose
- (d) Cellulose

Q19: What is the possible number of different types of lattices (3D)?

- (a) 4
- (b) 8
- (c) 14
- (d) 17

Q20: The boiling point of an azeotropic mixture of water and ethanol is less than that of water and ethanol. The mixture shows

- (a) no deviation from Raoult's Law.
- (b) positive deviation from Raoult's Law.
- (c) negative deviation from Raoult's Law.
- (d) that the solution is unsaturated.

Q21: Fluorine reacts with H_2S to produce

- (a) SF_6 and HF
- (b) SF_4 and HF
- (c) SF_6 , S and HF

(d) SF₂ and HF₄

Q22: Which of the following compounds has the highest boiling points?

(a) CH₃CH₂CH₂Cl

(b) CH₃CH₂CH₂CH₂Cl

(c) (CH₃)₃Cl

(d) CH₃CH(CH₃)CH₂Cl

Q23: Ketones react with Grignard reagent to produce .

(a) tertiary alcohols

(b) primary alcohols

(c) secondary alcohols

(d) None of these

Q24: Honey contains primarily

(a) fat

(b) minerals

(c) lipid

(d) carbohydrate

Q25: What is the hybridization of interhalogen compounds of the type XX'₅?

(a) sp³d²

(b) sp²d²

(c) sp⁴d³

(d) sp³d³

SECTION B

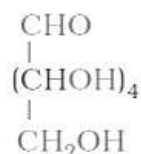
Q26: What is the coordination number in a square close-packed structure in two dimensions?

- (a) 4
- (b) 2
- (c) 6
- (d) 3

Q27: Which of the following do not depend on temperature?

- (a) Normality
- (b) Molarity
- (c) Molality
- (d) % W/V (weight/volume)

Q28: The following molecule is called as



- (a) carbohydrate
- (b) Vitamin
- (c) Protein
- (d) Lipid

Q29: Which of the following element is most reactive?

- (a) Chlorine
- (b) Fluorine
- (c) Bromine
- (d) Iodine

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: Grignard reagent (CH_3MgBr) on reaction CH_3OH will give:

- (a) Aldehyde
- (b) Ethane
- (c) Ester
- (d) Methane

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: Which of the following compounds can yield only one monochlorinated product upon free radical chlorination?

- (a) 2, 2-Dimethylpropane
- (b) 2-Methylpropane
- (c) 2-Methylbutane
- (d) n-Butane

Q37: An element forms a cubic unit cell with edge length 405 pm. Molar mass of this element is 2.7×10^{-2} kg/mol and its density is given as 2.7×10^3 kg/m³. How many atoms of this element are present per unit cell

- (a) 2
- (b) 4
- (c) 6
- (d) 1

Q38: By heating phenol with chloroform in alkali, it is converted into

- (a) Phenol benzoate
- (b) Salicylic acid
- (c) Anisole
- (d) Salicylaldehyde

Q39: Total number of voids in 0.5 mole of a compound which forms hexagonal close packed structure is

- (a) 9.033×10^{23}
- (b) 3.011×10^{23}
- (c) 12.044×10^{23}
- (d) 6.022×10^{23}

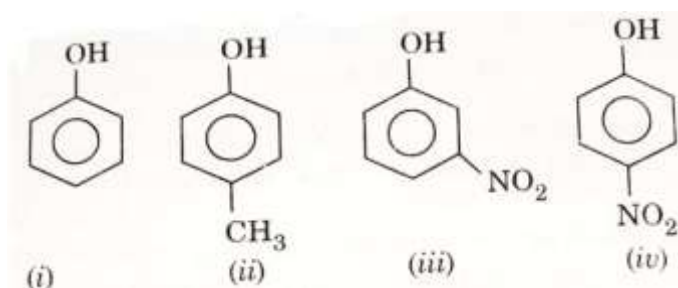
Q40: Molarity of the solution is

- (a) The number of moles of solute dissolved per litre of the solution
- (b) The number of moles of the solute dissolved per kilogram of the solvent
- (c) Number of grams of solute dissolved per kilogram of solvent
- (d) The number of gram mole of the solute dissolved per ml. of the solution

Q41: Which of the following elements can be involved in $\pi p - \pi d$ bonding?

- (a) Carbon
- (b) Nitrogen
- (c) Boron
- (d) Phosphorus

Q42: In the following compounds:



The order of acidity is

- (a) (ii) > (i) > (iii) > (iv)
- (b) (i) > (iv) > (iii) > (ii)
- (c) (iv) > (iii) > (i) > (ii)
- (d) (iii) > (iv) > (i) > (ii)

Q43: Which of the following does not exist as an octatomic solid?

- a) Sulphur
- b) Tellurium
- c) Selenium
- d) Oxygen

Q44: Complete hydrolysis of RNA yields

- (a) nitrogen containing base
- (b) phosphoric acid
- (c) All of these
- (d) a pentose sugar

Q45: Assertion (A): NF_3 is a weaker ligand than $\text{N}(\text{CH}_3)_3$.

Reason (R): NF_3 ionizes to give F^- ions in aqueous solution.

- (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 (A): KCN reacts with methyl chloride to give methyl isocyanide.

Reason (R): CN^- is an ambident nucleophile.

- (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: Glycine must be taken through diet.

Reason: It is an essential amino acid.

- (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 (A): Among the hydrides of the nitrogen family, BiH_3 has the highest boiling point.

Reason (R): The boiling point increases down the group because of an increase in size.

- (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 (A): The packing efficiency is maximum for the fcc structure.

Reason (R): The coordination number is 12 in fcc structures.

- (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: Molarity is preferred over molality in handling solutions in chemistry laboratory because

- (a) Molality changes with pressure
- (b) Molality changes with temperature
- (c) Molarity changes with pressure
- (d) Molarity changes with temperature

Q51: RNA does not have the nitrogen base of _____

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

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:

Fluorine, chlorine, bromine, iodine and astatine are members of Group 17. These are collectively known as the halogens. The halogens are highly reactive non-metallic elements. Fluorine and chlorine are fairly abundant while bromine and iodine less so. Fluorine is present mainly as insoluble fluorides and small quantities are present in the soil, river water plants and bones and teeth of animals. All these elements have seven electrons in their outermost shell ($ns^2 np^5$). The halogens have the smallest atomic radii in their respective periods due to maximum effective nuclear charge. Halogens display smooth variations in their physical properties. Fluorine and chlorine are gases, bromine is a liquid and iodine is a solid. Their melting and boiling points steadily increase with atomic number. All halogens are coloured. F_2 , has yellow, Cl_2 , greenish-yellow, Br_2 , red and I_2 , violet colour.

Q53: Which of the following is the correct set of increasing atomic radius

- (a) $F > I > Cl > Br$
- (b) $F > Cl > Br > I$
- (c) $Br > I > F > Cl$
- (d) $Cl > Br > I > F$

Q54: __ is the most electronegative element in the periodic table.

- (a) Br
- (b) F
- (c) Cl
- (d) I

Q55: Why negative electron gain enthalpy of fluorine is less than that of chlorine?

- (a) Due to the small size of fluorine atom
- (b) Due to strong interelectronic repulsions in the relatively small 2p orbitals of fluorine
- (c) Both (a) and (b)
- (d) None of these