

# PUNJAB-BOARD-CLASS-12-CHEMISTRY-053-A-2025 Question Paper

Time Allowed :3 Hours	Maximum Marks :80	Total Questions :21
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## General Instructions

1. All questions are compulsory.
2. Question paper consists of 18 questions divided into 4 sections A, B, C and D.
3. Section A comprises of 1 question of 20 multiple choice type questions of 1 mark each.
4. Section B comprises of 7 questions of 2 marks each.
5. Section C comprises of 7 questions of 4 marks each.
6. Section D comprises of 3 questions of 6 marks each.
7. An internal choice is provided in 3 questions of Section C and D each. You have to attempt only one of the alternatives in all such cases.
8. Use of calculator is not allowed.

It has been observed that nucleus of a living cell is responsible for this transmission of inherent characters, also called heredity. The particles in the nucleus of cell, responsible for heredity, are called chromosomes which are made up of proteins and another type of biomolecules called nucleic acids. These are mainly of two types, the deoxyribonucleic acids (DNA) and ribonucleic acid (RNA). Since nucleic acids are long chain polymers of nucleotides, so they are also called polynucleotides. RNA molecules are of three types and they perform different functions. They are named as messenger RNA (m-RNA), ribosomal RNA (r-RNA) and transfer RNA (t -RNA).

1(i). Give full form of DNA and RNA.

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1(ii). How many types of RNA are there?

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1(iii). Who is responsible for heredity?

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1(iv). Define heredity.

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1(v). How many types of nucleic acids are there?

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1(vi). CO is stronger ligand than  $\text{Cl}^{-1}$ .

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1(vii). The colour produced in Victor Meyer test for primary alcohol is deep blue.

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1(viii). Formic acid is obtained from red ants.

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1(ix). IUPAC name of Acetone is Butanone.

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1(x).  $\text{Ni}(\text{CO})_4$  is diamagnetic.

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1(xi). The units of ebullioscopic constant is :

- (A)  $\text{K kg mol}^{-1}$
  - (B)  $\text{mol kg K}^{-1}$
  - (C)  $\text{kg mol}^{-1} \text{K}^{-1}$
  - (D)  $\text{K mol kg}^{-1}$
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1(xii). Galvanisation is applying a coating of :

- (A) Cr
  - (B) Cu
  - (C) Zn
  - (D) Pb
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1(xiii). The units of first order reaction :

- (A)  $s^{-1}$
  - (B) s
  - (C)  $\text{mol L}^{-1}$
  - (D)  $\text{L}^{-1} \text{ s}$
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1(xiv). What is the mole fraction of benzene in solution containing 30% by mass in carbon tetrachloride ?

- (A) 0.540
  - (B) 0.459
  - (C) 0.500
  - (D) 0.300
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1(xv). The porous membrane used in reverse osmosis plant is made up of :

- (A) Cellulose acetone
  - (B) Potassium nitrate
  - (C) Mercuric iodide
  - (D) Starch
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1(xvi). What is DDT among the following :

- (A) Fertilizer
  - (B) Biodegradable pollutant
  - (C) Non-Biodegradable pollutant
  - (D) Green House gas
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1(xvii). In the following, strongest Acid is :

- (A)  $\text{CH}_3\text{CH}_2\text{COOH}$
  - (B)  $\text{CH}_3\text{COOH}$
  - (C)  $\text{C}_6\text{H}_5\text{COOH}$
  - (D)  $\text{C}_6\text{H}_5\text{CH}_2\text{COOH}$
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1(xviii). Benzioc Acid reacts with  $\text{LiAlH}_4$  to give :

- (A) Ethylene
- (B) Methyl Benzene
- (C) Phenol

(D) Benzyl Alcohol

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**1(xix). Vinegar is dilute aqueous solution of :**

- (A) Ethanoic acid
  - (B) Benzoic acid
  - (C) Citric acid
  - (D) Oxalic acid
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**1(xx). The oxidation state of Fe in  $[\text{Fe}(\text{CN})_6]^{-3}$  :**

- (A) +3
  - (B) +2
  - (C) +4
  - (D) -3
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**2. Write two differences between double salt and co-ordination compounds.**

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**3. Define monodentate ligands and give example.**

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**4 . Why do alcohols have higher boiling point than haloalkanes of the same molecular mass ?**

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**OR**

**4 . How will you convert propan-1-ol to propan-2-ol ?**

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**5 . Describe Rosenmund reduction.**

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**OR**

5 . Lower carboxylic acids are highly soluble in water. Explain.

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6. How will you obtain chlorobenzene from aniline ?

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7. Explain why methylamine is a stronger base than Ammonia ?

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8. Give two differences between DNA and RNA.

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9. Give two differences between ideal and non-ideal solution.

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10 . Calculate the molal elevation constant of water, it being given that 0.1 molal aqueous solution of a substance boils at  $100.052^{\circ}\text{C}$ .

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OR

10 . 18 gm of glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) is dissolved in 1 kg of water in a saucepan. At what temperature will the water boil at 1.013 bar pressure ?  $K_b$  for water is  $0.52 \text{ K kg mol}^{-1}$ .

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11. Give two differences between Galvanic Cell and Electrolytic cell.

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12. How many Coulombs of electricity are required for complete oxidation of 90 gm of  $\text{H}_2\text{O}$  ?

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13. Give two differences between order of reaction and molecularity of reaction.

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14 . The rate constant for a first order reaction is  $60 \text{ sec}^{-1}$ . How much time will it take to reduce the concentration of the reaction to  $1/10^{\text{th}}$  of its initial value ?

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OR

14 . Calculate the half-life time of a first order reaction having  $K=8\text{min}^{-1}$ .

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15. Why do Zr and Hf exhibit similar properties ?

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16. Calculate the two third life of a first reaction having  $K=5.48 \times 10^{-14}\text{s}^{-1}$ .

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17 . Compare the acidic character of Primary, Secondary and Tertiary alcohol.

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OR

17 . Explain Reimer Tiemann reaction of Phenols.

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18. Why is aniline less basic than ethylamine ?

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19 . Calculate the molar conductance  $\Lambda_m^\circ$  for  $\text{CaCl}_2$ , given that  $\lambda^\circ(\text{Ca}^{+2}) = 119.5 \text{ S cm}^2 \text{ mol}^{-1}$  and  $\lambda^\circ(\text{Cl}^-) = 76.3 \text{ S cm}^2 \text{ mol}^{-1}$ .

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OR

19 . Write the Nearest equation and calculate the e.m.f of the following cell at 298K.

$\text{Fe(s)} \text{ — } \text{Fe}^{2+}(0.001\text{M}) \text{ — } \text{H}^+(1\text{M}) \text{ H}_2(1\text{atm}) \text{ — Pt.}$

Given  $E_{Fe^{+2}/Fe}^{\circ} = -0.44 \text{ V}$ .

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20 . Write the reaction: (i) Wurtz-fitting reaction (ii) Ullmann reaction (iii) Gattermann reaction (iv) Hunsdiecker reaction (v) Balz-Schiemann reaction

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20 a. Write four differences between  $SN^2$  and  $SN^1$  reaction.

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20 b. Define Optical activity.

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21 a. Give three differences between Lanthanoids and Actinoids.

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21 b. Explain why  $Cu^{+2}$  salts are coloured while  $Zn^{+2}$  salts are colourless ?

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OR

21 a. Transition metals form alloys with other metals. Explain.

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21 b. How many unpaired electrons are present in  $Fe^{+3}$ ,  $Zn^{+2}$  and  $Mn^{+2}$  ?

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