

B-9-X

Roll No.

Total No. of Questions : 4]

[Total No. of Printed Pages : 8

12thARM(SZ)JKUT2024**1109-X****CHEMISTRY**

Time : 3 Hours]

[Maximum Marks : 70

General Instructions :

- (i) There are total four Sections in the question paper. All questions are compulsory.
- (ii) **Section-A** contains 10 Objective Type Questions (Multiple Choice Questions) of 1 mark each. $1 \times 10 = 10$ marks
- (iii) **Section-B** contains 9 Very Short Answer Type Questions of 2 marks each to be answered in **20-30** words.
 $2 \times 9 = 18$ marks
- (iv) **Section-C** contains 9 Short Answer Type Questions of 3 marks each to be answered in **100-150** words. $3 \times 9 = 27$ marks
- (v) **Section-D** contains 3 Long Answer Type Questions of 5 marks each to be answered in **150-200** words. $5 \times 3 = 15$ marks
- (vi) Use log table if necessary. Use of scientific calculators is not allowed.

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Turn Over

SECTION-A

1 each

**OBJECTIVE TYPE QUESTIONS
(MULTIPLE CHOICE QUESTIONS)**

1. Select the correct one :

(i) In which mode of expression the concentration of solution remain independent of temperature ?

(A) Molarity

(B) Normality

(C) Formality

(D) Molality

(ii) If an aqueous solution of glucose is allowed to freeze, then crystals of which will be separated out first ?

(A) Glucose

(B) Water

(C) Both of these

(D) None of these

(iii) The amount of an ion liberated on an electrode during electrolysis does not depend upon :

(A) Current strength

(B) Conductance of the solution

(C) Time

(D) Electrochemical equivalent of the element

(iv) Collision theory is applicable to :

- (A) First order reaction
- (B) Zero order reaction
- (C) Bimolecular reaction
- (D) Intramolecular reaction

(v) Alkyl halides undergoing nucleophilic bimolecular substitution involve :

- (A) Formation of carbocation
- (B) Racemic mixture
- (C) Inversion of configuration
- (D) Retention of configuration

(vi) Among the following compounds strongest acid is :

- (A) $\text{HC} \equiv \text{CH}$
- (B) C_6H_6
- (C) C_2H_6
- (D) CH_3OH

(vii) The weakest base among the following is :

- (A) Dimethylamine
- (B) Aniline ✗
- (C) Methylamine
- (D) Ethylamine

(viii) A transition metal exists in its highest oxidation state. It is expected to behave as :

- (A) A chelating agent
- (B) A central metal in a coordination compound
- (C) An oxidising agent
- (D) A reducing agent

(ix) The human body does not produce :

- (A) Enzymes
- (B) DNA
- (C) Vitamins
- (D) Hormones

(x) Adenosine is an example of :

- (A) Nucleotide
- (B) Nucleoside
- (C) Purine base
- (D) Pyrimidine base

SECTION-B

2 each

VERY SHORT ANSWER TYPE QUESTIONS

2. (i) What is the difference between Rate Law and Law of Mass Action ?
- (ii) What is meant by didentate and ambidentate ligands ?
- (iii) Why are alcohols less acidic than water ?
- (iv) What is diazotisation ?
- (v) Write *two* main functions of carbohydrates in plants.
- (vi) Write IUPAC names of :
- (a) $[\text{CrCl}_2(\text{en})(\text{NH}_3)_2]^+$
- (b) $\text{K}_3[\text{Fe}(\text{CN})_6]$
- (vii) Why molecularity is applicable only for elementary reactions and order is applicable for elementary and as well as complex reactions ?
- (viii) How does average rate of reaction differ from instantaneous reaction rate ?
- (ix) Why are haloarenes less reactive than haloalkanes towards nucleophilic substitution reactions ?

SECTION-C

3 each

SHORT ANSWER TYPE QUESTIONS

3. (i) Formic acid (methanoic acid) is stronger acid than acetic acid (ethanoic acid). Explain.
- (ii) Define conductivity and molar conductivity for the solution of an electrolyte.
- (iii) Explain the following about transition metals :
- (a) Magnetic behaviour
 - (b) Oxidation states
- (iv) How is potassium dichromate prepared from chromite ore ? Give its three oxidising properties. <https://www.jkboseonline.com>
- (v) Discuss briefly giving an example in each case the role of co-ordination compounds in :
- (a) Biological system
 - (b) Medicinal chemistry
- (vi) How will you convert ethyl bromide to :
- (a) Ethane
 - (b) Ethoxyethane
 - (c) Ethanenitrile ?

- (vii) What are phenols ? How do they differ structurally from aromatic alcohols ?
- (viii) What is Hinsberg's reagent ? How will you distinguish between primary, secondary and tertiary amines by it ?
- (ix) What are α -amino acids ? How are they related to proteins ?
Give the structure of two amino acids ?

SECTION-D

5 each

LONG ANSWER TYPE QUESTIONS

4. (i) Define :
- (a) Mole fraction
 - (b) Molality
 - (c) Molarity

Calculate the mole fraction of ethylene glycol ($C_2H_6O_2$) in a solution containing 20% of $C_2H_6O_2$ by mass.

Or

Define and explain elevation in boiling point. How can you calculate the molecular mass of a non-volatile solute with it ?

(ii) Define Kohlrausch's law. How does it help in :

- (a) Calculation of λ° for a weak electrolyte
- (b) Degree of dissociation of a weak electrolyte ?

Or

What are fuel cells ? Describe $H_2 - O_2$ fuel cell.

(iii) Describe the following :

- (a) Esterification
- (b) Cannizzaro reaction
- (c) Cross aldol condensation
- (d) Decarboxylation

Or

- (a) Write *five* methods for the preparation of aldehydes.
- (b) How are aldehydes distinguished from ketones using Tollen and Fehling's reagents ? Give chemical reactions.

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