

**B-9-Z**

Roll No.

Total No. of Questions : 4]

[Total No. of Printed Pages : 8

**12<sup>th</sup>ARM(SZ)JKUT2024**

**1109-Z**

**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) The molarity of 900 g of water is :

(A) 50 M

(B) 55.5 M

(C) 5 M

(D) Cannot be calculated

(ii) The depression in freezing point for 1 M urea, 1 M glucose and 1 M NaCl are in the ratio :

(A) 1 : 2 : 3

(B) 3 : 2 : 2

(C) 1 : 1 : 2

(D) None of these

(iii) In the electrolytic cell, flow of electrons is from :

(A) Cathode to anode in the solution

(B) Cathode to anode through external supply

(C) Cathode to anode through internal supply

(D) Anode to cathode through external supply

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(iv) The time required for 100 percent completion of a zero order reaction is :

(A)  $\frac{2K}{a}$

(B)  $\frac{a}{2K}$

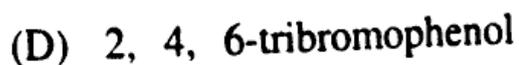
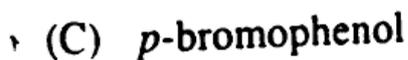
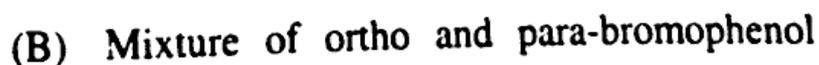
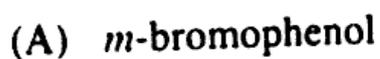
(C)  $\frac{a}{K}$

(D)  $aK$

(v) Among the following, the molecule with highest dipole moment is :



(vi) Phenol reacts with bromine in chloroform at low temperature to give :



(vii) Strongest base is :

- (A)  $C_6H_5NH_2$
- (B)  $CH_2=CHCH_2NH_2$
- (C)  $HC=CCH_2NH_2$
- (D)  $CH_3CH_2CH_2NH_2$

(viii)  $KMnO_4$  on heating to red hot gives :

- (A)  $K_2MnO_4 + MnO_2 + O_2$
- (B)  $K_2MnO_3 + MnO_2 + O_2$
- (C)  $K_2O + MnO_2 + O_2$
- (D) None of these

(ix) Nitrogen base that is found in RNA but absent in DNA is :

- (A) Uracil
- (B) Thymine
- (C) Cytosine
- (D) Adenine

(x) Deficiency of Vitamin  $B_1$  causes the disease :

- (A) Convulsion
- (B) Beri-Beri
- (C) Cheilosis
- (D) Sterility

SECTION-B

2 each

VERY SHORT ANSWER TYPE QUESTIONS

2. (i) What is the effect of temperature on the rate of reaction ?
- (ii) What is the difference between inner and outer orbital complexes ?
- (iii) Direct nitration of aniline is not carried out at all. Explain why.
- (iv) How will you synthesise salicylic acid from phenol ?
- (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) Explain the following about acetic acid :
- (a) Its boiling point is higher than that of *n*-propanol
  - (b) It is weaker than chloroacetic acid and formic acid
  - (c) Acetic acid is a stronger than phenol.
- (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  $\alpha$ -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  $\lambda^\circ$  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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