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Total No. of Questions—14]

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**KH2RO9**

**8337**

**CHEMISTRY**

PAPER—A

Maximum Marks—60

Time Allowed—3 Hours

**(Long Answer Type Questions)**

1. State and explain de Broglie's equation.

*Or*

Explain Molecular Orbital theory taking examples of  $H_2$  and  $O_2$  molecules. 5

2. The boiling point of the solution gets raised on dissolution of non-volatile solute. Explain how the property is used for finding the molecular mass of the solute.

*Or*

Explain the following terms :

(a) Molality

(b) Molarity

(c) Mole fraction. 5

3. Define Activation Energy. Explain the effect of temperature on the reaction rate.

*Or*

Show that for the reactions of the first order :

(a) Half-life period is independent of initial concentrations

(b) Units of rate constant do not depend upon the units of concentration. 5

P. T. O.

4. What are Emulsions ? How are they prepared and classified ?

**Or**

Describe Langmuir adsorption theory. Based on this theory derive the equation for adsorption. How does Freundlich adsorption equation follow from it ? 5

5. Name the chief ore of Aluminium. How does Aluminium extracted from its chief ore ?

**Or**

How is Sulphuric acid prepared by contact process ? Give its important uses. 5

**(Short Answer Type Questions)**

6. Which quantum number helps in the calculation of angular momentum of the electron and how ? 3
7. What are point defects in Crystals ? Describe the Schottky defects in Crystals. 3
8. Explain Magnetic properties of Solids. 3
9. Starting with the thermodynamic relationships  $G = H - TS$ , derive the following relationship  $\Delta G = - T\Delta S_{total}$  3
10. State and explain Second law of Thermodynamics. 3
11. What is a Galvanic cell ? Give the symbolic representation of the Daniell cell. 3
12. "Corrosion is an Electro-chemical Phenomenon". Explain. 3

**(Very Short Answer Type Questions)**

13. The following very short answer type questions of two marks, each may be answered in a few sentences or as required.
- (a) Why does entropy of a solid increase on Fusion ? 2
- (b) Write Nernst equation. 2
- (c) What happens when  $XeF_6$  is hydrolysed ? 2
- (d) Oxygen is diatomic and gaseous in nature. Explain. 2



**(Objective Type Questions)**

14. Choose the correct/most appropriate answer and write it in your Answer-book :

(i) Decomposition of  $\text{NH}_3$  on the surface of Tungsten is a reaction of

- A. Ist order
- B. IInd order
- C. IIIrd order
- D. Zero order.

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(ii) The rate constant of a chemical reaction has units  $\text{L mol}^{-1}\text{S}^{-1}$  order of the reaction will be

- A. Zero order
- B. Ist order
- C. IInd order
- D. IIIrd order.

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(iii) How many types of space lattice are possible in a Crystal ?

- A. 23
- B. 7
- C. 230
- D. 14.

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(iv) The Osmotic pressure of 1M solution at  $27^\circ\text{C}$  is

- A. 2.46 atm
- B. 24.6 atm
- C. 1.21 atm
- D. 12.1 atm.

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(v) Which of the following does not show Positive deviation from Raoult's law ?

A. Benzene—Chloroform

B. Benzene—Acetone

C. Benzene—Ethanol

D. Benzene—Carbon tetrachloride.

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(vi) Which of the following is the strongest Acid ?

A. HOCl

B. HOClO<sub>2</sub>

C. HOClO<sub>3</sub>

D. HOClO.

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