[This question paper contains 2 printed pages.]

Sr. No. of Question Paper : 6174 **D** **Your Roll No.....**

Unique Paper Code : 217573

Name of the Course : **B.Sc. (H) Geology**

Name of the Paper : Inorganic Chemistry (GEHT-504)

Semester : V

Time : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions.
3. Each question carry **15** marks.

1. (a) Describe the following methods
   (i) Zone refining
   (ii) Mond's Process

   (b) What is the effect of temperature and pressure on the coefficient of viscosity ?

   (c) Draw the labelled phase diagram alongwith one example in each case of the following cases :
   (i) Upper CST
   (ii) Lower CST
   (iii) Upper as well as Lower CST

2. (a) Give the sources of contamination and their toxicity and antidotes of
   (i) Lead
   (ii) Arsenic
   (iii) Mercury and
   (iv) Cadmium

   (b) What is the effect of temperature and pressure on surface tension of a liquid ?

P.T.O.

(c) What is the effect of impurities on the mutual solubility of two partially miscible liquids

(i) If impurity dissolves in both liquids

(ii) If impurity is soluble in only one liquid

3. (a) Define Raoult's Law. Show that the relative lowering of vapour pressure of a solution containing a non-volatile solute is equal to the mole fraction of the solute in the solution.

(b) What is the effect of temperature and pressure on collision frequency ?

(c) Derive Gibbs Helmholtz equation in terms of effect of temperature on chemical potential.

4. (a) Show that the variation of chemical potential of a component 'i' with pressure is given by

$$d\mu_i = V_{i,m}dp$$

(b) Derive Gibbs-Duhem Equation.

(c) What are partial molar quantity ? Explain.

5. (a) Write the role of Na^+ and K^+ ions in the living system.

(b) Explain the role of Metal Chelates in living system.

(c) Write the structure of Chlorophyll.

6. (a) Give two methods of preparation of diborane and discuss its structure.

(b) Explain the thermal stability of the hydrides of group I and group II elements.

(c) What happens when NaH reacts with

(i) CO

(ii) $SiCl_4$

(iii) Fe_3O_4

7. (a) Define the following :

(i) Collision number

(ii) Mean free path of molecules

(iii) Collision frequency

(b) Why drop number method is more accurate than drop weight method for the determination of surface tension of a liquid by Stalagmometer ?

(c) Define viscosity. Give its S.I. unit.

(100)