(This Question Paper contains 2 printed pages)

Sr. No. of Question Paper: *5738*   Roll No:

Unique Paper Code   :   217573

Name of the course   :   B.Sc.(H) Geology, V^{th} Semester   F

Name/ Title of the paper   :   GEHT 504 –Inorganic Chemistry-I

Semester   :   V

Duration   :   3 Hours

Max Marks   :   75

Instructions for candidates:

Attempt any five questions. Each question carry 15 marks

Q.1 (a) Derive the following forms of Gibbs – Duhem Equation.
$$Sdt - Vdp + \sum n_i d\mu_i = 0, \text{ (where } i=1 \text{ to } n)$$

(b) Define chemical potential. What is its physical significance?
(c) Show that the variation of chemical potential of a component 'i' with pressure is given by
$$d\mu_i = V_{i,m} dp$$

Q.2 (a) Write notes on the following
(i) Zone refining.
(ii) Hydrometallurgy.
(b) What is the effect of pressure on the coefficient of viscosity.
(c) Define the principle of equipartition of energy.

Q3. (a) Give the sources of contamination and their toxicity and antidotes of
(i) Lead,
(ii) Mercury
(b) 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.
(c) What is the effect of temperature on viscosity of a liquids and gases.?

Q.4 (a) Define Surface Tension. Give its S.I. unit.
(b) Write down the method for the determination of surface tension by drop number method using stalagmometer
(c) What is the effect of temperature and pressure on collision frequency?

Q.5 (a) Give one method 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$_4$.

Q.6 (a) Write the role of Na^+ ions in the living system.
(b) Explain the role of Metal Chelates in the living system.
(c) Write down the role of Ca^{2+} ions in blood clotting

Q.7 Draw the labelled phase diagram alongwith one example in each case of the following
(i) Upper CST
(ii) Lower CST
(iii)Upper as well as lower CST