Note: Time allowed for Section – B and Section – C is 2 Hours and 40 minutes.

Section – B

Marks: 40

Q-II   Answer any TEN parts. Each part carries FOUR marks.

1. Calculate the percentage composition of each element in H_3PO_4

2. Explain the Aufbau principle.

3. State Moseley's law.

4. Sigma bond is stronger than pi(π) bond. Why?

5. Write the faulty postulates of KMT of gases.

6. Explain the difference in B.P° of water at sea level and at high mountains.

7. Explain why amorphous solids are also called as "super cooled" liquids?

8. Write a note on leveling effect of acids.

9. Show that $K_p = K_x \left(\dfrac{RT}{V} \right)^{\Delta n}$

10. Give the assumptions of collision theory of reaction rate.

11. Define solubility. Just name the factors which affect solubility of a solute in a solvent.

12. What is a state function? Give its characteristics.

13. What are electrochemical cells? Give their types.

Section – C

Marks: 27

Note : Attempt any THREE questions. All questions carry equal marks.

Q-III   (a)   Discuss the deviation of gases from ideal behaviour.

(b)   Calculate the wave number and wavelength of a photon when electron jumps from $n_2 = 4$ to $n_1 = 1$

Q-IV   (a)   Show the conjugate acid base pair for the given species.

i. CH_3COOH ii. NH_3 iii. H_2O

(b)   Balance the given redox equations by the half-reaction method.

i. $Z_n + Cr_2O_7^{2-} + H^+ \rightarrow Z_n^{2+} + Cr^{3+} + H_2O$

ii. $H_2O_2 + M_nO_4^- + H^+ \rightarrow M_n^{2+} + O_2 + H_2O$

Q-V   (a)   Explain vacuum distillation.

(b)   Explain the effect of change in P on the equilibrium position of a reversible reaction.

Q-VI   (a)   Give the postulates of VSEPR theory.

(b)   Compare the rates of reactions of ionic and covalent compounds with reasons.