Government General Degree College, Dantan-II
B. Sc (H) 2nd Semester Internal Evaluation-2020
Subject: Chemistry **Paper: CC-3 (T+P)**
F.M: 20 (Theory) + 10 (Practical) **Time: 2 h**

Answer any **one question** from each Part.

Part A : Inorganic Chemistry (Theory)

1. (a) Acidity of anhydrous HF substantially increased in presence of SbF_5. – Explain.
(b) Discuss the acid-base property of H_2SO_4 in the solvent H_2O and HF.
(c) Explain why $SOCl_2$ would behave as an acid in liquid SO_2?
(d) Explain the acidity order of different oxoacids of chlorine.
(e) Complete the following reaction according to the SHAB principle-
(i) $Li^+ + Cs^+ + F^- + I^- \rightarrow$ (ii) $Cu^{2+} + H^+ + {SO_4}^{2-} + S^{2-} \rightarrow$

2. (a) Write Pauli Exclusion principle. Hence show that the L-shell can hold a maximum 8 electrons.
(b) Draw the radial probability distributions for 2s and 2p orbitals of H atom and explain which one is more penetrating.
(c) Calculate the first Bohr radius of He^+ ion. Given the 1st Bohr radius of H atom = 0.529 Å.
(d) Calculate the frequency of line in the hydrogen spectrum of radiation emitted when an electron drops from the 3rd to 1st Bohr orbit.

3. (a) What do you mean by electronegativity? Discuss any method to measure it.
(b) Which one between oxygen and Nitrogen has higher 1st ionization energy? Discuss.
(c) Calculate the ionization energy of oxygen using Slater's rule.
(d) Explain why the electron affinity of Cl is higher than that of F.

4. (a) Explain why iodine is liberated when KI is added to an aqueous solution of $CuSO_4$, although $E^0_{Cu^{2+}|Cu} = (0.15V) < E^0_{I_2|I^-} = 0.54V$
(b) Balance the following chemical equation in ion-electron method:
$XeO_6^{4-} + Mn^{2+} + H^+ \rightarrow XeO_3 + MnO_4^- + H_2O$
(c) What is Zimmerman-Reinherdt solution ?
(d) What are disproportionation and comproportionation reactions?

Part B : Inorganic Chemistry (Practical)

1. Write down the procedure of estimation of carbonate and bicarbonate present together in a mixture.
2. Write the principle involved Estimation of Fe(III) and Cu(II) in a mixture using $K_2Cr_2O_7$.
3. Write down the procedure of estimation of Fe(II) and Fe(III) in a given mixture using $K_2Cr_2O_7$ solution.
4. Write the principle involved Estimation of Fe(III) and Mn(II) in a mixture using standardized $KMnO_4$ solution.