This question paper contains **2** printed pages]

SB—40—2022

FACULTY OF SCIENCE

B.Sc. (Second Year) (Fourth Semester) EXAMINATION

MAY/JUNE, 2022

(New Course)

CHEMISTRY

Paper-IX

(Physical and Inorganic Chemistry)

(Friday, 10-06-2022) **Time : 2.00 p.m. to 4.30 p.m.**

Time— 2½ Hours *Maximum Marks*—40

N.B. :— (*i*) Attempt *All* questions.

(*ii*) *All* questions carry equal marks.

(*iii*) Use of logarithmic table and non-programmable calculator is allowed.

1. Solve any *three* of the following : 3×5=15

(*i*) What are silicates ? Give its classification with example.

(*ii*) Give preparation, structure and applications of fullerene.

(*iii*) What are interhalogen compounds ? Give the preparation and structure of XY_7 type of interhalogen compound.

(*iv*) Give preparation structure and uses of F_2O.

(*v*) What are oxyacids of halogens ? Explain oxidation state, strength and stability of oxyacids of halogens.

2. Solve any *three* of the following : 3×5=15

(*i*) Derive the equation for rate constant of first order reaction. State its any *two* characteristics.

(*ii*) Explain any *two* methods of determining order of reaction.

P.T.O.

(*iii*) Discuss Arrhenius theory of electrolytic dissociation with its limitations.

(*iv*) State and explain Kohlrausch law. Give its any *two* applications.

(*v*) State and derive Lambert-Beers Law for light absorption by solution.

3. Solve any *two* of the following : 2×5=10

(*i*) Differentiate between order and molecularity of the reaction.

(*ii*) 0.5 Normal solution of salt placed between two platinum electrodes, 20 cm apart and area of cross section 4.0 cm^2 has a resistance of 25 ohms. Calculate the equivalent conductance of the solution.

(*iii*) Explain conductometric titration in case of precipitation titration. Give the advantages of conductometric titration.

(*iv*) A system is irradiated for 20 minutes and is found to absorb 4×10^{18} quantum per second. If the amount decomposed is 3×10^{-3} mole. Calculate the quantum efficiency of the reaction.

(Given $N_A = 6.023 \times 10^{23}$).