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**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.
- 2 (v) State and derive Lambert-Beers Law for light absorption by solution. ✓
3. Solve any two of the following : <https://www.srtmunonline.com>  $2 \times 5 = 10$
- ~~(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  $4.0 \text{ cm}^2$  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  $4 \times 10^{18}$  quantum per second. If the amount decomposed is  $3 \times 10^{-3}$  mole. Calculate the quantum efficiency of the reaction.

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

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