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**NA—23—2023**

**FACULTY OF SCIENCE**

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

**NOVEMBER/DECEMBER, 2023**

**(New Course)**

**CHEMISTRY**

**Paper IX**

**(Physical and Inorganic Chemistry)**

**(Thursday, 7-12-2023)**

**Time : 2.00 p.m. to 4.00 p.m.**

*Time—2 Hours*

*Maximum Marks—40*

*N.B. :— (i) Attempt all questions.*

*(ii) Use of logarithmic table and calculator is allowed.*

1. Solve any *three* of the following : 15

- (a) What are interhalogen compounds ? Explain structure of  $XY_5$  type of interhalogen compound.
- (b) Define fluorocarbon. Write properties and uses of Teflon.
- (c) Explain strength and stability of oxyacids of halogen.
- (d) What is silicate ? Write a note on chain silicate.
- (e) Define Carbide. Write preparation and properties of ionic carbide.

2. Solve any *three* of the following : 15

- (a) Derive equation for rate constant of zero order chemical reaction and give its characteristics.

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- (b) The half-life period of first order reaction is 20 minutes. How long will it take for completion of 40% reaction ?
- (c) Define the term specific conductance and equivalent conductance. Explain the effect of dilution and temperature on it.
- (d) State Kohlrausch's law and explain its application in determination of solubility of sparingly soluble salt and in determination of equivalent conductance of weak electrolyte at infinite dilution.
- (e) Explain the phenomenon of fluorescence and phosphorescence with Jablonski diagram.
3. Solve any *two* of the following : 10
- (a) Explain molecularity and order of reaction with suitable examples.
- (b) A system absorbs  $2.0 \times 10^{16}$  quantum of light per second on irradiation for 20 minutes. 0.002 mole of reactant was found to have reacted. Calculate quantum yield. ( $N = 6.023 \times 10^{23}$ )
- (c) Explain conductometric titration of strong acid and weak base.
- (d) Explain Arrhenius theory of electrolytic dissociation. Give its two limitations.