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VA—23—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

CHEMISTRY

Paper—IX

(Physical and Inorganic Chemistry)

(Wednesday, 4-12-2024)

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

Time—2 Hours

Maximum Marks—40

N.B. :— (i) All questions are compulsory.

(ii) Figures to the right indicate full marks.

(iii) Use of logarithmic table and calculator is allowed.

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

(a) Explain XY_5 type Inter-halogen compound with example.

(b) Define Zeolite. Discuss its classifications.

(c) Explain strength and stability of oxyacids of halogens.

(d) Define carbides. Give preparation, properties and structure of CaC_2 .

(e) What are polyhalides ? Give preparation, properties and structure of ICl_4^- .

P.T.O.

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

- (i) What is half life period ? State and derive half life for second order reaction.
- (ii) Define first order reaction and give its characteristics.
- (iii) Define specific conductance and give effect of dillution and temperature on it.
- (iv) State Kohlrausch law, name its applications.
- (v) When a substance was exposed to light for 20 minutes, 0.002 mole of it reacted. In the same time it absorbed 2×10^6 photons per second. Calculate quantum yield of the reaction. ($N = 6.02 \times 10^{23}$).

3. Answer any *two* of the following : 10

- (a) Derive rate equation for rate constant of second order reaction with $a \neq b$
- (b) The resistance of 0.1 N solution was placed between two electrodes which are 0.72 cm apart and cross-section area 2.25 cm^2 was 52.40 ohms. Calculate equivalent conductance.
- (c) What are the advantages of conductometric titration ? Discuss precipitation titration.
- (d) State and explain Lambert-Beer's law.