

This question paper contains 2 printed pages]

NA—13—2023

FACULTY OF SCIENCE AND TECHNOLOGY

B.Sc. (First Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

(CBCS/New Pattern)

CHEMISTRY

Paper-II

(Physical and Inorganic Chemistry)

(Wednesday, 6-12-2023)

Time : 10.00 a.m. to 12.00 noon

Time—2 Hours

Maximum Marks—40

N.B. :— (i) Attempt *all* questions.

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

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

(a) Explain the hydrides of group IA and IIA in brief.

(b) (i) Give the formation of complex of sodium with Salicyladehyde.

(ii) Explain the flame colouration of group IA element.

(c) Discuss the carbonates and bicarbonates of s-block elements.

(d) Write the rules for assigning oxidation number.

(e) Define oxidation, reduction, oxidizing agent and reducing agent according to electronic concept.

P.T.O.

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

- (a) Derive an expression for critical constants in terms of van der Waal's constants '*a*' and '*b*'.
- (b) State and explain 'Permutation'. Evaluate the value of $^{10}P_3$.
- (c) Discuss the factors affecting adsorption.
- (d) Explain the determination of crystal structure of potassium chloride (KCl) by X-ray diffraction method.
- (e) Define ideal and non-ideal gases. Calculate the root mean square velocity of O_2 molecule of $37^\circ C$.

(Given : $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$)

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

- (a) Define 'Axis of symmetry'. Explain the law of rational indices.
- (b) What is 'adsorption isotherm' ? Explain Langmuir adsorption isotherm.
- (c) Explain the deviation of gases from ideal behaviour.
- (d) What is S.I. unit of 'Force' and 'Density' ? Calculate the pH of 0.002 M NaOH solution.