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SB—22—2022

FACULTY OF SCIENCE

B.Sc. (First Year) (First Semester) EXAMINATION

MAY/JUNE, 2022

(CBCS/New Pattern)

CHEMISTRY

Paper II

(Physical and Inorganic Chemistry)

(Thursday, 9-6-2022)

Time : 10.00 a.m. to 12.30 p.m.

Time— 2.30 Hours

Maximum Marks—40

N.B. :— (i) Attempt All questions.

(ii) Figures to the right indicate full marks.

(iii) All questions carry equal marks.

(iv) Calculator and logarithmic table are allowed.

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

(a) Give the electronic configuration of alkali metals (Group IA).

(b) Define diagonal relationship. Explain the diagonal relationship between Li and Mg.

(c) Explain the biological importance of the Magnesium (Mg) and Calcium (Ca) in biosystem.

(d) Balance the following equation by ion-electron method :



(e) Explain the rules for assigning the oxidation number method.

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

(a) What is adsorption isotherm ? Discuss the Freundlich adsorption isotherm.

(b) Define critical temperature, critical pressure and critical volume. Calculate root mean square velocity of N_2 molecule at 127°C .

($R = 8.314 \text{ J/k mol.}$, Molar mass of $\text{N}_2 = 14 \times 10^{-3} \text{ kg}$)

P.T.O.

- (c) What are Miller indices ? Calculate Miller indices for planes :
- (i) $(-a, -b, -c)$
 - (ii) $(a, 2b, 2c)$
 - (iii) (a, b, c)
 - (iv) $(2a, 2b, 3c)$
- (d) Derive van der Waals equation.
- (e) Define Permutation and Combination. Evaluate :
- (i) 7P_3
 - (ii) 9C_5
 - (iii) ${}^{10}P_4$
3. Answer any *two* of the following : 10
- (i) Define pH and pOH. Derive the relationship between pH & pOH.
 - (ii) State and explain adsorption and its mechanism. Explain any *two* factors affecting adsorption.
 - (iii) Derive kinetic gas equation.
 - (iv) Write notes on :
 - (a) Types of Cubic lattice
 - (b) Elements of Symmetry.