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CC-300

M. Sc. EXAMINATION, Dec. 2018

(Third Semester)

(Main & Re-appear)

CHEMISTRY

CH625B

Physical Chemistry Special-I

(Electrochemistry and Solid State Chemistry)

Time : 3 *Hours*] [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit IV

7. State what are ionic liquids ? What are their characteristics properties ? Discuss what are the fundamental problems in the study of pure liquids electrolytes. **20**

8. Discuss lattice oriented models approached to ionic liquids. Write distribution function with respects to size of holes. **20**

Unit I

1. (a) What do you mean by electrified interface ? Distinguish between electrified and polarizable interface. Describe also method for the determination of electrical capacitance of the interface. **12**

(b) Write a note on Helmholtz Perrin model of electrified interface. Discuss its limitations and modifications also. **8**

2. (a) Discuss, how will you determine the surface excess of the interface. **12**

(b) Discuss Gouy-Chapman Model of electrified interface. **8**

Unit II

3. (a) Discuss the rate of electron transfer under the influence of electric field. **5**

(b) Derive Buttler-Volmer equation and explain special cases of this equation. **15**

4. (a) Discuss the term equilibrium exchange current density. **5**

(b) Define symmetry factor β. Explain physical significance of symmetry factor and its dependence on overpotential. **15**

Unit III

5. (a) What is Crystallography ? Name three fundamental laws of crystallography. **5**

(b) Discuss, how a crystal structure is determined by X-ray diffraction method ? **15**

6. (a) Discuss the crystal structure of zinc sulphide (ZnS). **8**

(b) With the help of schematic diagram discuss band theory of solids w.r.t. insulator, conductor, semiconductor (intrinsic and impurity semiconductors). **12**