(07/21-II)

5189

B. Sc. EXAMINATION

(For Batch 2014 & Onwards)

(Second Semester)

CHEMISTRY

CH-105

Physical Chemistry

Time : Three Hours *Maximum Marks : 26*

Note : Attempt *Five* questions in all. Q. No. 1 is compulsory. Attempt *two* questions from each Sections A and B. Each question of Sections A and B carries equal marks.

1. (a) What is difference between average rate of reaction and instantaneous rate of Reaction ?

   (b) Why the rate of reaction becomes nearly double for 10° rise of temperature ?

   (c) In the Arrhenius equation, how are the units of pre-exponential factor, a related to the unity of rate constant ?

   (d) What are the SI units of resistance ?

   (e) What is Conductivity Water ? What is its important use ?

   (f) Why Ostwald's law is not applicable to string electrolytes ? 1×6=6

Section A

2. (a) After 24 hours, only 0.125 g out of the initial quantity of 1 g of a Radioactive substance remains behind. What is its half life period ? 2

   (b) Define the term 'order of reaction' and 'specific reaction rate'. How does rate law differ from law of mass action ? 3

3. (a) List the main points of difference between molecularity and order of a reaction. 2

(b) Briefly explain the different methods used for determination of the order of Reaction. 3

4. (a) What are Pseudo-Unimolecular Reactions ? Give two examples of each. How are they studies experimentally ? 3

(b) A first order reaction is 40% complete in 50 minutes. Calculate the value of the rate constant. In what time will the reaction be 80% complete ? 2

Section B

5. (a) If specific conductivity of N/50 KCl solution at 298 K is 0.002765 ohm^{-1} cm^{-1} and Resistance of a cell containing this solution is 100 ohms, calculate the cell constant. 2

(b) State and explain 'Ostwald's Dilution law': Briefly describe its limitations. 3

6. (a) What do you mean by 'Transport Number' ? Briefly explain Hittorf's method for the determination of transport number of Ag^+ and NO_3^- in $AgNO_3$ solution when :

(i) Electrodes of Pt are used

(ii) Electrodes of Ag are used. 3

(b) Why is it not Possible to measure the limiting molar conductivity of a weak electrolytic experimentally ? 2

7. What are Buffer Solutions ? What are different types of Buffer solutions ? Explain the buffer action of each of them. 5