B.Sc.-III (CBCS Pattern) Semester - V

USCCHT10 : Chemistry-II (Physical Chemistry)

P. Pages : 2 **GUG/S/23/13090**

Time : Three Hours * 0 2 3 3 * Max. Marks : 50

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1. a) Define the terms specific conductance and equivalent conductance. Describe the method of its experimental determination. **5**

b) Explain the effect of dilution on specific conductance and equivalent conductance. **5**

OR

c) What do you mean by cell constant? How it is determined experimentally? **2½**

d) State Kohlrausch law. How it is used to determined solubility of sparingly soluble salt. **2½**

e) Give the limitations of Arrhenius theory. **2½**

f) Give any four advantages of conductometric titrations over visual titrations. **2½**

2. a) What do you mean by galvanic cell? Explain construction and working of Daniel cell. **5**

b) What is transport number? Explain Hittorf's method for determination of transport number. **5**

OR

c) Distinguish between electrolytic cell and electrochemical cell. **2½**

d) Explain reversible and irreversible electrodes with suitable examples. **2½**

e) State and explain faraday second law of electrolysis. **2½**

f) Describe an experiment to demonstrate the migration of ions towards the electrode on passing electricity. **2½**

3. a) What are concentration cell? Derive an expression for the emf of a concentration cell without transference. **5**

b) What do you understand by reference electrode? Describe construction and working of hydrogen electrode. **5**

OR

c) Explain metal - metal ion electrode and amalgam electrode. **2½**

d) Derive Nernst equation for EMF of cell. **2½**

e) Give any four advantages of potentiometric titration over visual titrations. **2½**

f) Write a short note on liquid junction potential. **2½**

4. a) Explain the phenomenon of black body radiation. Why classical mechanic could not explain this phenomenon? **5**

b) Derive the expression for energy and normalized wave function for a particle in one dimensional box. **5**

OR

c) Write Postulates of quantum mechanics. **2½**

d) Give comparative account of classical mechanics and quantum mechanics. **2½**

e) Give postulates of Bohr's theory and its advantages. **2½**

f) Explain physical significance of wave function. **2½**

5. Attempt **any ten** questions.

a) What is the unit of resistance? **1**

b) State Ohm's law. **1**

c) Define Sparingly soluble salt. **1**

d) What is activity coefficient? **1**

e) Define standard electrode potential. **1**

f) In cell representation, which cell is represented on left side? **1**

g) What is electromotive force? **1**

h) What is mean by salt bridge? **1**

i) What is quinhydrone electrode? **1**

j) State Heisenberg's uncertainty principle. **1**

k) What is Quanta? **1**

l) What is orthogonal wave function? **1**

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