2054

B.Sc. (Hons.) Bio-Informatics

Second Semester

BIN-2005: Chemistry – II

Time allowed: 3 Hours   Max. Marks: 60

NOTE: Attempt *five* questions in all, including Question *No. 1* which is compulsory and selecting two questions from each Unit.

x-x-x

1. Attempt the following.

   (a) Define adiabatic and isothermal processes.

   (b) Define molecular spectroscopy.

   (c) Elaborate Quantum Yield.

   (d) Write in brief about corrosion.

   (e) State and explain first law of thermodynamics.

   (f) What is Fluorescence.

                                                            (6x2)

UNIT-I

2. (a) Explain Hess's law of constant heat summation. Discuss its applications.

   (b) Derive an expression to calculate work done in reversible isothermal expansion of an ideal gas.

                                                            (6,6)

3. (a) Derive the relation between free energy change and equilibrium constant. (Van't Hoff reaction isotherm).

   (b) What is liquid junction potential. Derive an expression for it.

                                                            (6,6)

4. (a) What is Henderson-Hasselbalch equation for a buffer mixture of weak acid and its salt with strong base. Discuss it completely.

   (b) What are reference electrodes. Give their significance.

                                                            (6,6)

UNIT-II

5. Discuss in detail the following.

   (a) Selection rules in infrared spectroscopy

   (b) Absorption and emission spectroscopy

                                                            (6,6)

6. Describe the following briefly in NMR spectroscopy.

   (a) Chemical shift

   (b) Coupling constants

   (c) Shielding and deshielding effects

                                                            (3x4)

7. (a) Illustrate a brief introduction of Raman spectra.

   (b) State Beer Lambert's law. Derive this law for light absorption in solutions. Give its limitations.

                                                            (6,6)

x-x-x