Exam.Code:0040
Sub. Code: 0997

1058

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. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Attempt the following:-

a) Differentiate between isothermal and adiabatic processes.

b) (Explain first law of thermodynamics.

c) What is decomposition potential?

d) Elaborate quantum yield.

e) Define molecular spectroscopy.

f) Explain symmetric and asymmetric stretching (IR) with examples. (6x2)

UNIT – I

II. a) Give a brief account of the following:-

i) Hess's law

ii) Gibbs free energy

iii) Chemical potential

b) Discuss any three methods for prevention of corrosion. (6,6)

III. a) Illustrate the relation between free energy change and equilibrium constant.

b) Define enthalpy and derive the relationship between AH and AE at constant pressure.

c) What are reference electrodes? Give their significance. (4,4,4)

IV. a) Explain entropy change with the change of temperature and pressure. Also correlate the behavior with disorder/randomness.

b) Derive Nemst equation for measuring EMF of a cell.

c) Write a short note on liquid junction potential and overvoltage. (5,4,3)

P.T.O.

UNIT – II

V. a) Briefly describe the following in relation to NMR spectroscopy:

i) Chemical shifts and coupling constants

ii) Shielding and deshielding effects

b) Illustrate a brief introduction of Raman spectra. (8,4)

VI. Discuss the followings in detail:-

a) Fluorescence and Phosphorescence

b) Selection rules in infra-red (IR) spectroscopy and their use for predicting the number of IR active bands. (6,6)

VII. a) Explain the following:-

i) Absorption and emission spectroscopy

ii) Beer Lamberts law and extinction coefficients.

b) What is the principle of ESR spectroscopy? List its applications.

c) How do you differentiate the acetone from acetylene using infra-red (IR) spectra? (6,4,2)

x-x-x