1059
B.Sc. (Hons.) Bio-Informatics
Second Semester
BIN-2005: Chemistry – II

Time allowed: 3 Hours **Max. Marks: 60**

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

x-x-x

I. Attempt the following:-

   a) State second law of thermodynamics.

   b) What are fugacity and activity?

   c) Give expression for Nernst equation.

   d) What is phosphorescence?

   e) What is Larmor precession?

   f) Differentiate between a chromophore and auxochrome.   (6x2)

UNIT – I

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

   b) One mole of an ideal gas expands against a constant external pressure of 1 atm from a volume of 10 dm^3 to a volume of 30 dm^3. Calculate the work done by the gas in joules.

   c) Explain Hess's law of constant heat summation. Discuss its applications.   (3x4)

III. a) Derive an expression for the entropy of a mixture of ideal gases.
   b) Derive Van't Hoff reaction isotherm.   (6,6)

IV. a) What is liquid junction potential? Derive its expression.

   b) Write a detailed note on corrosion.

   c) Derive Henderson-Hasselbalch equation for a buffer mixture of weak base and its salt.   (3x4)

P.T.O.

UNIT – II

V. a) State and derive Lambert-Beer's law for light absorption in solutions. Give its limitations.

b) Discuss rotational vibration spectra of a diatomic molecule in detail.   (6,6)

VI. a) Discuss mechanism of nuclear spin-spin interaction in detail.

b) Explain anisotropic effects in NMR spectra giving suitable examples.   (6,6)

VII. a) How width and intensity of spectral lines is affected? Discuss in detail.

b) Give at least three types of molecular spectra shown by a molecule.   (6,6)

x-x-x