Exam Code: 0431
Sub. Code: 3443

2031

M.Sc. (Applied Chemistry/Pharmaceutical)

First Semester

Paper – 103: Physical Chemistry

Time allowed: 3 Hours Max. Marks: 60

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

x-x-x

I. Answer the following:-

a) What do you know about degrees of freedom and no. of phases? How can you calculate the same in a two components system?

b) What do you know about theory of absolute reaction rates?

c) What is mean ionic activity coefficient of an electrolyte? How it can be measured? (3x4)

UNIT – I

II. a) Give a comparative and detailed review of Maxwell Boltzmann, Box-Einstein and Fermi-Dirac statistics.

b) Explain micro and macrocanonical examples in detail. (2x6)

III. a) Explain a detailed view of Molar Partition function with reference to Monoatomic and diatomic moles.

b) Explain the following:-

i) Fugacity

ii) Activity

iii) Specific heat of solid (2x6)

UNIT – II

IV. a) Explain different categories of solid-liquid system containing two salts and water.

b) Explain ternary phase diagrams composed of three liquid system with two pairs of partially mixable liquids. (2x6)

P.T.O.

V. a) How can you classify two components systems? Explain the proper examples.

b) Explain critical solution properties and features of a phase diagram (three components system) at fixed T & P. (2x6)

UNIT – III

VI. Explain the following clearly:-

a) Flash photolysis

b) Temperature jump method

c) Stopped flow techniques (3x4)

VII. a) Discuss different methods for measurement of rate of slow reaction.

b) Explain B.E.T. theorem in detail. (2x6)

UNIT – IV

VIII. Explain salient features of:-

a) Langmuir Freundlich Adsorption isotherm

b) Gibb's Adsorption equation

(2x6)

IX. a) Give the detailed mechanism of various surface reactions.

b) Write a note on any one method of allegations and its advantages with other methods. (2x6)

x-x-x