C. ABDUL HAKEEM COLLEGE (AUTONOMOUS),
MELVISHARAM - 632 509.
SEMESTER EXAMINATIONS, NOVEMBER - 2018

M.Sc., CHEMISTRY **SEMESTER I**

P18MCH103 – PHYSICAL CHEMISTRY - I

Time: Three Hours Maximum: 75 Marks

SECTION - A (5 X 6 = 30 Marks)

Answer **ALL** Questions.

1. a) What is partial molar volume? Explain any one methods for the determination of partial molar volume.

(Or)

b) How the fugacity value varied with respect to temperature and pressure? Explain.

2. a) Derive the Eyring's equation using ARR theory.

(Or)

b) Show that Hammett equation is a linear free energy relationship.

3. a) Discuss the mechanism and kinetics of acid – base catalyzed reactions.

(Or)

b) Explain the competitive inhibition of enzyme catalysis reaction.

4. a) Discuss the rotational spectroscopy for non rigid diatomic rotor.

(Or)

b) Explain the effect of degeneracy on intensity lines in rotational spectrum.

5. a) Construct the character table for C_{2v} point group using H_2O molecule.

(Or)

b) Define classes of a group. How to determine the classes of a group with the help of similarity transformation to the elements?

SECTION - B (3 X 15 = 45 Marks)

Answer **ANY THREE** Questions.

6. Define the terms activity and activity coefficients. Explain the experimental determination of activity and activity coefficients for non electrolyte.
7. Discuss the postulates of ARR theory and derive the equation for reaction rate.
8. Discuss the mechanism and kinetics of enzyme catalyzed reactions. Explain the effect of pH and temperature of rate constants on enzyme catalyzed reactions.
9. Explain the fundamental principles involved in rotational spectroscopy and about the molecular parameters from rotation spectra.
10. (a) Discuss the properties of reducible and irreducible representation with examples.

(b) Explain the terms symmetry elements and symmetry operations.

****