Roll No.

B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, April/ May 2014

Common to All Branches

I- Semester

CY8151 & Engineering Chemistry

(Regulation 2012)

Time : 3 Hours   Answer ALL Questions   Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Define: Second Law of thermodynamics.

2. Calculate the entropy change in the thermodynamic expansion of 5 moles of an ideal gas from a volume of 10 liters to a volume of 100 liters.

3. Define: Functionality of a monomer.

4. Brief about the tacticity.

5. What is meant by pseudo molecular reactions?

6. Brief about the auto catalysis.

7. What are the types of electronic transitions?

8. Define: Stark –Einstein Law.

9. What are nanorods?

10. Give any two differences between bulk materials and nanoparticles.

Part – B (5 x 16 = 80 marks)

11. i) Describe the synthesis of nanomaterials by hydrothermal and solvothermal methods
    (8)
    ii) Explain about the risk discussion and future perspectives of nonomaterials.   (8)

12. a) i) Derive Clapeyron-Clausius equation. Discuss its applications.   (8)

    ii) Derive the four forms of Maxwell relations   (8)
                     OR
    b) i) What is meant by Van't Hoff isotherm? Derive an expression for the isotherm of a general reaction
                    $aA + bB \rightleftharpoons cC + dD$ (8)
    (ii) Derive Gibb's Helmholtz equation and discuss its applications   (8)

13. a) i) Differentiate between thermoplastics and thermosetting plastics. Give two examples each.   (8)

    ii) Brief about the following properties of the polymers.
    Tg, molecular weight-weight average, number average, polydispersity index   (8)

OR

b) (i) What is meant by addition polymerization? Discuss the mechanism of free radical polymerization with suitable example. (8)

(ii) Write notes on bulk, emulsion, solution and suspension polymerization techniques (8)

14. a) (i) Discuss about the mechanism of Langmuir –Hinselwood (8)

(ii) Applying Michaelis-Menton equation, discuss the kinetics of enzyme catalysed reaction. Find the order of the reaction when the substrate concentration is high. (8)

OR

(i) Derive the rate equation for a second reaction where the reactants are same (8)

b)

(ii) Hydrolysis of ethyl acetate by NaOH using equal concentrations of the reactants was studied by titrating 25 ml of the reaction mixture at different time intervals against standard acid. From the data given below, prove that this is a second order reaction and calculate the rate constant.

Time (min)	0	5	15	25	35
Volume of HCl used (ml)	16.00	10.24	6.13	4.32	3.41

(8)

15. a) (i) Explain the principle of UV-Visible spectroscopy. Give the block diagram and its functions (8)

(ii)Write in details about the Internal Conversion and Inter-system crossing. (8)

OR

b) (i) Explain about the chemilumescence and photo sensitization (8)

(ii) Write in details about Fluorescence and phosphorescence (8)