Code No. 2005

FACULTY OF ENGINEERING & INFORMATICS

B.E. I Year (Main) (Common to All Branches) Examination, June 2013

Subject: Engineering Chemistry

Time: 3 Hours **Max.Marks: 75**

Note : Answer all questions from Part A. Answer any Five questions from Part B.

PART – A (25 Marks)

1. Electrode potential of zinc is assigned a negative value, whereas that of copper a positive value. Give reason. (2)
2. Construct calomel electrode with electrode notation and electrode reaction. (3)
3. What are the limitations of I law of thermodynamics? (3)
4. One mole of an ideal gas expands from 10 lit. to 25 lit. at 25°C. Calculate the change in free energy of the process. (2)
5. Differentiate between anodic and cathodic coatings. (2)
6. Explain break point chlorination. (3)
7. Differentiate between thermoplastics and thermosetting resins. (3)
8. What are composites? What are their advantages? (2)
9. What is cracking? What is its significance? (3)
10. Calculate the minimum amount of air required for complete combustion of 1 kg of fuel containing: C = 90%, H = 3.5%, 0 = 3%, N = 1% and rest ash. (2)

PART – B (50 Marks)

11.(a) What is primary battery? Describe the construction and working of zinc-carbon battery with relevant reactions occurring during discharge. (6)
(b) Discuss the principle involved in the potentiometric acid-base titrations. (4)

12.(a) What is isothermal process? Derive an equation for the work done in isothermal reversible process. (5)
(b) Discuss the conditions of equilibrium and spontaneity in terms of free energy. (5)

13.(a) Explain electrochemical corrosion with mechanism. (6)
(b) Describe the softening of water by ion-exchange method. (4)

14.(a) Write preparation, properties and uses of (i) PVC and (ii) butyl rubber. (6)
(b) Define Homo, Hetero and copolymers with suitable examples. (4)

15.(a) What are the characteristics of a good propellant? (4)
(b) What is calorific value of fuel? Describe the determination of calorific value of fuel by Bomb calorimeter. (6)

16.(a) What is a cyclic process? Describe the carnot cycle for establishing the maximum convertibility of heat into work. (6)
(b) 2 Moles of an ideal gas expands reversibly and isothermally from a volume of 10 lit. to a volume of 20 lit at 27°C. Calculate the q, w, and ΔE for the process. (4)

17.(a) what is paint? What are its constituents and their functions? (6)
(b) What is cetane number? What is its significance? (2)
(c) Write any three applications of conducting polymers. (2)