FACULTY OF ENGINEERING & INFORMATICS

B.E. I Year (Suppl.) (Common to All Branches) Examination, January 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. Distinguish between extensive and intensive properties. (2)
2. What is partial molar property? Give its significance. (3)
3. Explain the effect of dilution on equivalent and specific conductance. (3)
4. What is calomel electrode? Give its reduction half-cell reaction. (3)
5. Differentiate between chemical and electrochemical corrosion. (3)
6. Explain the principle of softening of water by ion-exchange method. (3)
7. What are homo and copolymer? Give one example to each. (2)
8. Write a short note on applications of conducting polymers. (2)
9. Define octane and cetane numbers. (2)
10. What are advantages of fuel-cells? (2)

PART – B (50 Marks)

11.(a) What is the first law of thermodynamics? Justify the need for the second law. (5)
   (b) Calculate the change in entropy accompanying the heating of one mole of an ideal gas from a temperature of 298 K to 596 K at constant pressure. (C_v = 3/2 R) in SI units. (5)

12.(a) Define the following terms:
   (i) Specific conductance
   (ii) Ionic mobility
   (iii) Transport number (6)

   (b) A salt solution of 0.1 N strength offers a resistance of 220 ohms with a conductance cell of 0.90 cm^{-1} cell constant. Calculate the specific and equivalent conductance of the salt solution. (4)

13.(a) Write a note on the following:
   (i) Galvanic corrosion
   (ii) Electroplating (4)

   (b) What are the different types of hardness of water? Explain their determination by using EDTA method. (6)

14.(a) Bring out the differences between thermoplastics and thermosetting resins. (4)
   (b) Give the preparation, properties and uses of the following polymers:
   (i) Bakelite
   (ii) Butyl rubber (6)

15.(a) What are chemical fuels? Give their classification with examples. (4)
   (b) Describe the analysis of coal by proximate analysis method. What is its significance? (6)

16.(a) Describe the construction and working of lead-acid battery. (6)
   (b) What are boiler troubles? How they are prevented. (4)

17.(a) Derive Clausius – Clapeyron equation. Give its applications. (6)
   (b) Write a note on conductometric titrations. (4)

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