FACULTY OF ENGINEERING & INFORMATICS
B.E. I - Year (Main) Examination, June 2014

Subject : Engineering Chemistry

Time : 3 Hours   Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.
PART – A (25 Marks)

1   Give success and limitations of I law and II law of thermodynamics.   (3)
2   Explain why entropy change is zero for reversible process and entropy change is
    positive for irreversible process for the same state change.   (3)
3   Differentiate between primary and secondary battery.   (3)
4   Derive Nernst equation using equation relating ΔG and ΔG^o.   (3)
5   Explain the formation of anodic areas on the surface of metallic materials through
    differential aeration and contact with different metals with reactions.   (3)
6   Explain break point chlorination with the help of graph.   (2)
7   Write the chemical equation for preparation of Bakelite.   (2)
8   What is conducting polymer? Give two examples.   (2)
9   Give the relationship between Higher calorific value (HCV) and Lower calorific value
    (LCV).   (2)
10 Explain Octane rating.   (2)

PART – B (50 Marks)

11 (a) Derive and compare isothermal reversible work expression with adiabatic
         reversible work expression.   (6)
    (b) A reversible carnot cycle does work equivalent to 150 K J per cycle if heat supplied
         by cycle is 225 kJ at 227°C per cycle calculate
         (i) the temperature at which heat is rejected (ii) thermal efficiency of engine (4)
12 (a) What are fuel cells? Explain with an example and give their advantages.   (5)
    (b) What are different types of electrodes ? Explain with their electrode reaction and
         electrode potential equation.   (5)
13 (a) Discuss the factors affecting the rate of corrosion.   (6)
    (b) Describe electroplating of Nickel.   (4)
14 (a) Give the differences between thermosets and thermoplastics.   (5)
    (b) Give the structure of monomer of natural rubber and discuss the vulcanization of
         rubber and properties of vulcanized rubber.   (5)
15 (a) Give requirements of a good fuel.   (3)
    (b) Discuss the determination of calorific value of fuels by Bomb calorimeter with neat
         diagram and corrections.   (7)
16 (a) Explain determination of temporary and permanent hardness of water of EDTA
         method.   (5)
    (b) Derive Calusius-Clapeyron equation for liquid vapour equilibrium and discuss its
         applications.   (5)
17 (a) Discuss principle and method of potentiomentric acid-base titrations.   (6)
    (b) Give construction, and working of dry cell.   (4)

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