

Code No. 60051 M

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° . (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 potentiometric acid-base titrations. (6)
- (b) Give construction, and working of dry cell. (4)