Code No. 9005 10

FACULTY OF ENGINEERING AND INFORMATICS

B.E. I - Year (Old) Examination, May / June 2015

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 Free energy change for a reaction involving two electrons in a cell is -125 kJ/mole. Calculate emf of the cell. 3

2 How can you predict the spontaneous nature of reaction from electrochemical series.? 3

3 Carnot cycle operates between source temperature of 1'50 D CJ, and sink temperature of 50 °C and absorbs 250 Joules of heat from source. '.Calculate the work produced by carnot cycle. 3

4 Explain the importance of phase rule. 2

5 Explain the cause for prevention of corrosion of metalSbypaint. 2

6 What is the importance of calcium carbonate equivalent in water chemistry and define PPM? 3

7 How will you distinguish plastic from elastomer? 2

8 How are the silicone polymer chains cured : or cross-linked? 2

9 Give the uses and composition of diesel-an petrol. 3

10 Give the principle of rocket propulsion 2

PART — B (50 Marks)

11 a) Distinguish reversible cell .from irreversible cell with examples. 4

b) Give construction, half Cell hotation, Nernst equation and significance of hydrogen electrode. 6

12 a) Describe Carnottheorem and give its significance. 4

b) Give the importance of free energy and drawback of entropy with derivation of criteria for spontaneity and equilibrium in terms of these two. 6

13 a) Compare with examples and chemical reactions of galvanic corrosion with differential aeration corrosion. 6

b) Explain the electroplating of Nickel. 4

14 a) Give the differences between thermoset and thermoplastic resins with examples. 5

b) Give the preparation and applications of carbon nanotubes. 5

15 a) Explain with flow diagram of cracking by fixed bed catalytic cracking and its significance. 6

b) Define and give the importance of octane number and cetane number. 4

16 Give the construction and chemical reactions during the operation of the cells as given below 5+5

a) Methanol-oxygen fuel cell b) Nickel-cadmium battery

17 a) Discuss the phase diagram of water system with its significance. 6

b) Discuss the importance of breakpoint chlorination with graph in water chemistry. 4

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