Code No: 09A1BS03 R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I Year I Semester Examinations, May/June-2013

ENGINEERING CHEMISTRY

(Common to CSE, IT)

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

Answer any five questions

All questions carry equal marks

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1.a) What are reference electrodes? Explain the construction and functioning of Quinhydrone electrode?

b) What are batteries? How are they classified? Explain the construction and, functioning of the Lead-Acid Cell.

2.a) What is oxidation corrosion and how does it takes place? Explain the mechanism of oxidation corrosion.

b) Explain the process of galvanizing and tinning.

3.a) Write brief account on

i) Conducting polymers ii) Liquid Crystal polymers

b) What is vulcanization of rubber? How does it improves the properties of natural rubber?

c) Differentiate thermoplastic resins from thermosetting resins.

4.a) Write short notes on the following

i) Calgon conditioning ii) Carbonate conditioning

b) Describe the causes and effects of scale formation.

c) A sample of hard water contains the following dissolved salts per liter. CO_2 =44 mg, $Ca(HCO_3)_2$ = 16.4 mg, $Mg(HCO_3)_2$ = 14.6 mg, $CaCl_2$ = 111 mg, $MgSO_4$ = 12 mg, and $CaSO_4$ = 13.6 mg. Calculate the temporary and permanent hardness of water in ^{0}Fr and ^{0}Clarke.

5.a) What are colloids? Discuss their optical and electrical properties.

b) Differentiate between physisorption and chemisorption.

6.a) Explain the ultimate analysis of a solid fuel and its significance. b) What is cracking? How gasoline is obtained from fixed bed catalytic cracking.

7.a) What is meant by heat treatment of steel? Explain the different heat treatment processes carried out with relevant applications.

b) Distinguish between the triple point and eutectic point.

8.a) Distinguish between hydrodynamic lubrication and boundary lubrication.

b) How Portland cement manufactured by dry process? What is the role of gypsum in cement?

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