

Code No: 121AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech I Year Examinations, June - 2022****ENGINEERING CHEMISTRY****(Common to CE, EEE, ME, ECE, CSE, IT, MCT, MIE, PTM)****Time: 3 Hours****Max. Marks: 75**

Answer any five questions
All questions carry equal marks

- 1.a) What is a reference electrode? Discuss the construction of calomel electrode and calculate the pH of unknown solution using calomel electrode.
- b) Discuss the electrochemical theory of corrosion and explain the mechanism of rust formation in acidic and neutral medium. [8+7]
- 2.a) Explain the discharging and charging process of a lead acid storage battery with reactions.
- b) Discuss the principle involved in cathodic protection method and describe the two types of cathodic protection methods. [7+8]
- 3.a) What are conducting polymers? Discuss the classification, mechanism and applications of conducting Polymers.
- b) Explain the synthesis, properties and applications of
(i) PVC (ii) Bakelite (iii) BUNA – S rubber [6+9]
- 4.a) Explain the setting and hardening steps of cement with relevant chemical reactions involved.
- b) What are Lubricants? How are they classified? Give examples. [8+7]
- 5.a) Describe the ion exchange method used for softening of water with a neat diagram.
- b) Discuss about the following:
i) Scale and Sludge formation
ii) Caustic embrittlement [9+6]
- 6.a) What is the principle of EDTA method? Describe the estimation of Hardness of water by EDTA method.
- b) Discuss Break point chlorination. [9+6]
- 7.a) Discuss proximate method of analysis of coal sample and give its significance.
- b) What is cracking? Explain fixed bed catalytic cracking process and its advantages. [8+7]
- 8.a) Explain one component system phase diagram using water system.
- b) What are colloids? How are they classified? Mention its properties and applications. [8+7]

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