

Code No: 111AE**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech I Year Examinations, December - 2017****ENGINEERING CHEMISTRY****(Common to CE, EEE, ME, ECE, CSE, EIE, IT, MCT, ETM, MMT, AE, AME, MIE, PTM, AGE)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

- 1.a) Write the Principle involved in Pitting corrosion. [2]
- b) Define Conductivity and molar conductivity for the solution of an electrolyte. Discuss their variation with concentration. [3]
- c) Explain the functionality of monomer with suitable examples. [2]
- d) Explain the variation of Physical properties of polymer with their molecular weight by taking one example. [3]
- e) Sample of ground water has 150mg/L of Mg^{2+} . Calculate the hardness expressed in milli-equivalents per litre. [2]
- f) Write the disadvantages of zeolite process which is used to purify water. [3]
- g) Write the differences between octane number and cetene number. [2]
- h) Why should an ideal fuel have moderate ignition temperature? [3]
- i) What is condensed phase rule equation? Explain the terms involved in it. [2]
- j) Explain 'Triple Point' in a one compound system of phase diagram. [3]

PART- B**(50 Marks)**

- 2.a) Write the Chemical reaction of recharging the lead storage battery, highlighting all the materials that are involved during recharging.
- b) What is paint? Explain its constituents and functions. [5+5]

OR

- 3.a) What are reference electrodes? Describe the construction of Calomel electrode.
- b) Discuss the differences between Galvanizing and Tinning with neat diagrams.
- c) What is the principle involved in CH_3OH-O_2 fuel cell. [4+4+2]
- 4.a) Write the structure of Isotactic, Syndiotactic and Atactic forms by taking suitable example.
- b) Explain the chemical reactions involved in setting and hardening of cement.
- c) Write short notes on Vulcanization. [3+4+3]

OR

- 5.a) Differentiate Thermo plastics and Thermosetting plastics with suitable examples.
- b) Write the preparation properties and engineering applications of styrene rubber.
- c) Write the mechanism of Thin Film Lubrication. [3+4+3]

- 6.a) Explain the Principle involved in the estimation of hardness of water by EDTA method.
b) What is Caustic Embrittlement? Write the causes of it and explain the preventive methods.
c) What are parameters for portable water? [4+3+3]

OR

- 7.a) Explain principle and method of purification of domestic water by Reverse Osmosis and also write its significance.
b) What is Calgon conditioning? Explain.
c) Explain Chemical equations involved in Lime soda process. [4+2+4]

- 8.a) What is Cracking ? What are its objectives? Explain 'Fixed bed catalytic cracking' with neat diagram.
b) What is Dulong's formula? How to calculate calorific value by Dulong's method.[5+5]

OR

- 9.a) Explain how coal sample is analysed by ultimate method. Write its significance.
b) What is synthetic petrol? With neat diagram explain how to prepare synthetic petrol by Fischer-Tropsch's process. [5+5]

- 10.a) What is phase diagram? Explain phase diagram of Iron-Carbon with respective to heat treatment and cooling curves.
b) Explain the classification, electrical and optical properties of colloids. [5+5]

OR

- 11.a) With neat phase diagram explain Lead-Silver two component system.
b) Write short notes on:
i) Langmuir adsorption isotherm.
ii) Applications of Colloids. [5+5]

---ooOoo---