

Code No: 51005

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year Examinations, July - 2021

ENGINEERING CHEMISTRY

(Common to CE, EEE, ME, ECE, CSE, IT, AE, AME, MIE)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

- 1.a) What is the principle involved in Galvanic series? Write the applications of Galvanic series.
- b) Calculate the EMF of a concentration cell at 25°C consisting of two Zn- electrodes immersed in solution of Zn^{+2} ions of 0.1M and 0.01 M concentrations. [7+8]
- 2.a) What is sacrificial anodic protection? Explain with suitable examples.
- b) Explain the mechanism of electro chemical corrosion. [7+8]
- 3.a) Write the principle, properties and applications of conducting polymers.
- b) Write a short note on Teflon and Bakelite. [7+8]
- 4.a) What is the cause for caustic embrittlement? Write the mechanism and preventive methods.
- b) A sample of water on analysis is found to contain 4 mg/L $Ca(HCO_3)_2$, 8 mg/L $CaSO_4$ and 12 mg/L $MgCl_2$. Calculate temporary, permanent and total hardness of water. [7+8]
- 5.a) Derive Langmuir adsorption isotherm and write its significance.
- b) Give the preparation, properties and applications of Nano materials. [7+8]
- 6.a) How gasoline is synthesized by Fischer-Tropsch's process. Explain.
- b) Find out the total amount of air required for the complete combustion of 10 kg of a sample fuel containing 75% C, 5% H_2 , 8% O_2 , 3% S, and the rest is N_2 . [7+8]
- 7.a) Enumerate the Lead-Silver phase diagram and indicate the degrees of freedom.
- b) Draw the neat phase diagram of Iron- Carbon phase system. Explain about the phases, number of degrees of freedom. [7+8]
- 8.a) Define refractory. What are the specifications of good refractory material?
- b) Describe the synthesis of Portland cement. [7+8]

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