

1st Semester B.Tech Mid Term Examination 2019-2020

ENGINEERING CHEMISTRY(18BS1T05)

Duration: 01:30

Full Marks: 25

1 Answer All

- a Chemists preferred synthetic Zeolite over natural ones. Give reason. 1
- b A sample of water contains constituents like NaHCO_3 , Na_2SO_4 , KCl , NaNO_3 , etc. Can we call this hard water? 1
- c Mention some advantages of hard water. 1
- d What is dry corrosion? 1
- e Write the chemical formula of rust? 1

2 Answer any Two

- a Calculate the amount of soda required for softening of 10,000 L of water containing MgCl_2 = 95 ppm, NaCl = 10 ppm & Fe_2O_3 = 20 ppm. The purity of soda is 95%. 2
- b What happens to temporary hardness constituents when hard water is boiled? Give equations. 2
- c Mention the limitations of the zeolite softening process. 2

3 Answer any Two

- a In what ways chemical corrosion is different from electrochemical corrosion? 2
- b Discuss the tinning process with a suitable example. 2
- c Define corrosion. Mention two factors affecting the rate of corrosion. 2

4 Answer any One

- a How can we soften hard water using the 'Ion-exchange resin process'? Explain the process with a suitable diagram. 6
- b Why soft water should not be used for drinking purposes? Calculate the amount of lime(80% pure) and soda(85% pure) required (in Kg) for softening of 10^5 L of hard water containing 120 ppm of MgSO_4 , 190 ppm of MgCl_2 and 100 ppm of Fe_2O_3 . 6

5 Answer any One

- a (A) State reasons for: (i). Wire mesh corrodes faster at the joints. (ii). Corrosion occurs in steel pipe connected to copper plumbing; (B) How can we prevent corrosion of metals using 'Anodic Coating'? 6
- b Give reasons for the following; (A). Corrosion-resistant of iron can be significantly improved by alloying it with Cr or Al; (B). Rusting of iron is faster in saline water than in ordinary water; (C) Zinc metal is used for cathodic protection of iron from rusting. 6