

Code:20BS1105

I B.Tech - I Semester – Regular Examinations – JULY 2021**CHEMISTRY OF MATERIALS
(MECHANICAL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

UNIT – I

1. a) Distinguish between sludge and Scale formed in boilers. 7 M
- b) Utilize Zeolite process to remove Hardness present in the industrial water and explain the mechanism with necessary equations. 7 M
- OR
2. a) Estimate the temporary, permanent and total hardness of the water sample When the water has following composition per/L of water
 $\text{CaSO}_4 = 136 \text{ mg.}$, $\text{MgCl}_2 = 190\text{mg.}$, $\text{Mg}(\text{HCO}_3)_2 = 72\text{mg.}$, $\text{SiO}_2 = 25\text{mg.}$, $\text{NaCl} = 12\text{mg.}$, $\text{MgSO}_4 = 60\text{mg.}$ 7 M
- b) Make use of Electro dialysis method How sea water can be make water fit for use. Describe with neat model diagram. 7 M

UNIT – II

3. a) Construct and Explain working of Calomel Electrode. Determine Single electrode potential of Standard Zn electrode by connecting with saturated calomel electrode then the cell potential observed is 1.008v 7 M
- b) Outline the importance of Electrochemical series with examples. 7 M

OR

4. a) Explain the working of Lead acid battery with important chemical reaction process both in charging and discharging process. 7 M
- b) Develop a solar panel and Summarize the applications of Solar cell. 7 M

UNIT-III

5. a) When Aluminum under go dry corrosion, Discuss with mechanism of oxidation corrosion how the further corrosion reduced? 7 M
- b) Outline Influencing factors effecting corrosion. 7 M

OR

6. a) Compare Anodic Coating from Cathodic coatings. 7 M
- b) What is a varnish? Discuss the role of different constituents present in it. 7 M

UNIT – IV

7. a) Suggest the best application of special steels with their chemical compositions. 7 M
- b) Illustrate the Setting and hardening of cement with chemical reactions. 7 M

OR

8. a) List out the Composition of Cement with the function of each constituent. 7 M
- b) Explain the preparation, properties and uses of polyphosphazines. 7 M

UNIT – V

9. a) Expand word TEM. Characterize the nanomaterials by TEM. Draw the neat model Sketch of TEM. 7 M
- b) Describe the best part of applications of Nanomaterials in waste water treatments and lubricants. 7 M

OR

10. a) Discuss an account on smart materials with classification. 7 M
- b) Identify the Useful applications of self healing and Memory shape smart materials in the present scenario. 7 M