PVP 19

Code: 19BS1102

I B.Tech - I Semester – Regular Examinations - December - 2019

CHEMISTRY OF MATERIALS

(Common for CIVIL, ME)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 5 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each question carries 12 marks.
4. All parts of Question paper must be answered in one place.

PART – A

1. a) Mention any two differences between hard water and soft water.
   b) Explain the function of solar energy in photo voltaic cells.
   c) Identify and explain the type of corrosion when steel screws are fitted with marine hardware.
   d) Write the chemical reactions involved in the setting of cement.
   e) Write the basic principle of TEM.

PART – B

UNIT – I

2. a) Describe the process of desalination of brackish water by reverse osmosis method. 6 M

   b) Illustrate the Ion exchange method for softening of hard water. 6 M

OR

3. a) Explain the determination of hardness of water by EDTA method. 8 M

   b) Distinguish the scale and sludge formed in boilers. 4 M

UNIT – II

4. a) Write the construction and working theory of calomel electrode. 6 M

   b) Write the chemical reactions involved in discharging and charging equations in lead-acid storage cell. 6 M

OR

5. a) Define electrode potential. Derive an equation for the determination of single electrode potential. 6 M

   b) Write the construction, working and applications of H_2-O_2 fuel cell. 6 M

UNIT-III

6. a) Explain the mechanisms involved in electrochemical corrosion by i) evolution of H_2 type ii) absorption of O_2 with necessary equations 8 M

   b) Describe the process of sacrificial anodic protection. 4 M

OR

7. a) Discuss any six factors affecting rate of corrosion. 6 M
   b) Describe the process of galvanizing with neat diagram. 6 M

UNIT – IV

8. a) Describe manufacturing of Portland cement with relevant chemical equations. 8 M
   b) Write the preparation of polyphosphazines. 4 M

OR

9. a) Write the differences between thermoplastics and thermosetts. 6 M
   b) Explain different types of steel. 6 M

UNIT – V

10. a) Describe the characterization of nanoparticles by BET method. 6 M
    b) Define smart materials. List out various types of smart materials with one example for each. 6 M

OR

11. a) Describe the sol-gel method for the synthesis of nano particles. 6 M
    b) Explain the use of nano materials in waste water treatment. 6 M