

Code: 19BS1103

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

**ENGINEERING CHEMISTRY
(Computer Science and Engineering)**

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) Calculate the emf of a concentration cell at 25 °C consisting of two Zn electrodes immersed in solutions of Zn^{2+} ions of 0.1 M and 0.01 M concentrations.
- b) What are the main differences between primary and secondary batteries?
- c) Define renewable and non-renewable energies. Give examples of each.
- d) What is meant by electro less plating?
- e) List out the advantages of polymers over metals and alloys.

PART – B

UNIT – I

2. a) Derive Nernst equation for the calculation of cell emf. 6 M
- b) i) Differentiate between the characteristics of an electrolytic cell and those of a galvanic cell. 4 M
- ii) The emf of a concentration cell gradually decreases. Why? 2 M

OR

3. a) What is ion selective electrode? Explain working and also mention limitations of any one ion selective electrode. 6 M
- b) Write short notes on hydrogen and calomel electrodes. 6 M

UNIT – II

4. a) Describe the construction, working, advantages and disadvantages of Hydrogen Oxygen fuel cell. 6 M
- b) Illustrate the construction and working of Zinc air battery. 6 M

OR

5. a) Describe the construction, working and limitations of Propane and Oxygen fuel cell. 6 M
- b) Compare the advantages and disadvantages of each with dry, Zinc air and lithium cells. 6 M

UNIT-III

6. a) Explain the procedure for manufacturing of photovoltaic cells by using chemical vapor deposition technique. 6 M
- b) List out the merits and demerits of solar energy. 6 M

OR

7. a) Write briefly on p and n type semiconductors. 6 M
- b) Write a short note on sources of renewable energy. 6 M

UNIT – IV

8. a) What is metal finishing? List out the technological importance of metal finishing. 6 M
- b) What are the main components used in electroplating process? What is the effect of concentration of metal ion and complexing agent in the electro deposition? 6 M

OR

9. a) Explain about the electroless plating of Nickel. 6 M
- b) Explain about the electroplating of gold. 6 M

UNIT – V

10. a) Explain the process of characterization of nanomaterial by SEM. 6 M
- b) List out the differences between thermoplastics and thermosetting plastics. 6 M

OR

11. a) Illustrate the procedure for preparation of nanomaterial by sol – gel method. 6 M
- b) Write down the preparation, properties and engineering applications of Polystyrene. 6 M