16. (a) Describe calomel electrode with a neat diagram. (6)

(b) Describe the construction and working of H_2-O_2 fuel cell. (5)

UNIT IV

17. (a) Explain galvanic corrosion with suitable example. (6)

(b) Describe the process of electroplating and metal cladding. (5)

Or

18. (a) Explain the electrochemical theory of corrosion. (6)

(b) Discuss in detail about anodizing. (5)

UNIT V

19. (a) Draw a neat sketch for two component Pb-Ag system and explain it. (6)

(b) State Gibbs phase rule. Explain the terms in it. (5)

Or

20. (a) Write the applications of phase rule to sulphur system. (6)

(b) Draw and explain the cooling curve of a mixture. (5)

5781003

B.Tech. DEGREE EXAMINATION, SEPTEMBER 2020.

First Semester

Common to All Branches

CHEMISTRY

(For 2013-14 onwards)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Differentiate alkaline and non-alkaline hardness.
2. What is caustic embrittlement?
3. Name the catalyst used in cationic and anionic polymerisation.
4. Distinguish thermoplastics and thermosetting plastics.
5. Calculate the reduction potential of lead electrode in contact with a solution of 0.018M Pb^{2+} ions. [$E^0 = -0.13V$]
6. What is a battery? How does it differ from a cell?
7. Differentiate chemical and electro chemical corrosion.

8. Define corrosion inhibitor.

9. What is condensed phase rule?

10. Calculate the number of phases present in the following systems.

(a) $NH_4Cl_{(s)}$

(b) An emulsion of oil in water.

SECTION B — (5 × 11 = 55 marks)

Answer ONE question from each Unit.

UNIT I

11. (a) A sample of water was found to contain the following species, on analysis:

Ca^{2+} = 40 mg/L, Mg^{2+} = 24 mg/L, Na^{+} = 8.05 mg/L, HCO_{3^-} = 18.3 mg/L, SO_4^{2-} = 55.85 mg/L and Cl^{-} = 6.74 mg/L.

Express the results in terms of salts present as their $CaCO_3$ equivalents. (6)

(b) How desalination is carried out in reverse osmosis method? (5)

Or

12. (a) Distinguish between sludges and scales in boilers. (6)

(b) Compare the salient features of zeolite process and lime-soda process. (5)

UNIT II

13. (a) Explain vulcanization and state the improvement in properties of rubber after vulcanization is carried out. (6)

(b) Discuss the mechanism of Ziegler-Natta polymerization. (5)

Or

14. (a) Explain injection moulding technique of plastics. (6)

(b) Write the preparation and uses of (i) Bakelite (ii) Polyurethane. (5)

UNIT III

15. (a) Derive Nernst equation for single electrode potential. (6)

(b) Give the construction and working of Ni-Cd battery. (5)

Or