B 2131

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Second Semester

Mechanical Engineering

CM 132 — CHEMISTRY — II

(Common to Civil Engineering/Computer Science and Engineering/Electrical and Electronics Engineering/Electronics and Communication Engineering /Electronics and Instrumentation Engineering /Instrumentation and Control Engineering/ Mechatronics Engineering/Bio-Medical Engineering/Information Technology)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Explain the law of mass action.

2. Define enthalpy of a reaction.

3. How does a thermoplastic differ from a thermoset?

4. What are liquid resins?

5. Differentiate between an electrochemical cell and a battery.

6. What is a galvanic cell? Give an example.

7. What is meant by refining of metals? Name any one refining process.

8. Name any one ore of any metal and write its chemical formula.

9. What is powder metallurgy?

10. Name two articles or alloys made by powder metallurgy techniques.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Write the mechanism of E_1 and E_2 organic reactions. (8)

(ii) Explain the features of Ellingham diagram in extraction of metals from their metal oxides. (8)

Or

(b) (i) What are refractory materials? Classify them into different classes with examples. (8)

(ii) With a phase diagram, explain the characteristics of any one of the two component alloy systems. (8)

12. (a) (i) How are commodit engineering plastics polyesters and nylon 6, 6 made? (8)

(ii) What are sheet molding compounds? Give a typical recipe of SMC. How is it prepared? (8)

Or

(b) (i) Differentiate between polymer blends and polymer alloys. Give one example each for polymer blend and polymer alloy and mention their uses. (8)

(ii) Write a note on : (1) Metal matrix (2) Ceramic matrix composites. (8)

13. (a) (i) How is a small hole made in a small work-piece by electrochemical machining? (8)

(ii) Mention at least eight factors that affect corrosion. (8)

Or

(b) (i) Describe the construction and working of an electrochemical sensor. (8)

(ii) How is aluminum extracted by Electro-Winning process? (8)

14. (a) (i) Discuss any two methods of ore dressing. (8)

(ii) Describe any four non-ferrous alloys, their composition and uses. (8)

Or

(b) (i) Explain the processes of electrochemical refining and zone refining of metals. (8)

(ii) What is meant by quenching, normalising, carburising and flame hardening of metals? (8)

15. (a) (i) Mention the sequence of processes followed in powder metallurgy techniques. (8)

(ii) What is meant by compacting in powder metallurgy? Mention any six of them. (8)

Or

(b) (i) What are the applications of powder metallurgy? (8)

(ii) Write a note on special alloys. (8)
