Reg. No. : | | | | | | | | | | | |

Q 2145

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 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, Biomedical Engineering and Information Technology)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Apply law of mass action to any one equilibrium reaction.
2. Define work function.
3. What is a polymer? Give an example.
4. Name the three steps in free radical polymerization reactions.
5. Name two rechargeable cells/batteries.
6. Can a bulky battery provide more voltage than a smaller one.
7. What is meant by ore-dressing in metallurgy?
8. What is an alloy steel?
9. What is the main difference between conventional metallurgy and powder metallurgy?
10. Name two articles or alloys made by powder metallurgy techniques.

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) Write the mechanism of addition across double bonds in organic compounds. (8)

(ii) Draw Ellingham diagram for any two metal oxides and explain their behaviour in the extraction of the respective metals from those oxides. (8)

Or

(b) (i) Discuss the properties, refractoriness under load and thermal-spalling, of refractory materials. (8)

(ii) With a phase diagram explain the characteristics of a two component eutectic alloy system. (8)

12. (a) (i) How are polypropylene, polyvinyl acetate, nylon 6 and teflon made?(8)

(ii) Discuss the preparation, composition and application of any two molding compounds. (8)

Or

(b) (i) What are polymer blends and polymer alloys? How do they differ? Mention their uses? (8)

(ii) What are composite materials? Discuss the composition, fabrication and application of any one composite material. (8)

13. (a) (i) With a diagram explain the process of electrochemical machining. (8)

(ii) Mention at least eight ways of controlling corrosion. (8)

Or

(b) (i) Explain how an electrochemical sensor senses a signal and converts it to a electrical signal. (8)

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

14. (a) (i) Discuss any two methods of preparing pure metal by refining. (8)

(ii) Mention the composition and uses of any four special alloys. (8)

Or

(b) (i) Explain the gravity separation and magnetic concentration of ores. (8)

(ii) How are the properties of metals / alloys improved by various Physical and chemical treatments. (8)

15. (a) (i) How are metal powders prepared for powder metallurgy. (8)

(ii) Discuss various compacting techniques involved in powder metallurgy. (8)

Or

(b) (i) List the advantages of powder metallurgy. (8)

(ii) What are the final finishing operations given to articles made by powder metallurgy? (8)
