C 3167

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

Second Semester

Chemical Engineering

CY 1154 — CHEMISTRY — II

(Common to Polymer Technology/Textile Technology (Fashion Technology) Petroleum Engineering)

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why is bond energy of N_2 higher than that of O_2?

2. Ni(II) Square planar complexes are diamagnetic - Account for this.

3. What is meant by co-polymerisation? Give one example

4. What is thermocole?

5. What is a varnish?

6. State Pilling Bed worth rule.

7. What is calgon conditioning?

8. Define the term break point chlorination.

9. What are anti-knock agents? Give one example.

10. Why is coke preferred to coal in metallurgical processes?

PART B — (5 × 16 = 80 marks)

11. (a) (i) What is hydrogen bonding? Explain inter and intra molecular hydrogen bonding with atleast two examples. (8)

(ii) With a neat sketch describe the splitting of d orbitals in an octahedral field. (8)

Or

(b) (i) (1) CCl_4 has no dipole moment but $CHCl_3$ has Account for this. (4)

(2) Boiling point of water is higher than that of hydrogen fluoride. Why? (4)

(ii) What is band theory? Enumerate its salient features. (8)

12. (a) (i) Discuss the effect of polymer structure on the following properties

(1) Strength

(2) Chemical resistance (4 + 4)

(ii) Differentiate thermoplastics resins from thermosetting resins. Give atleast two examples for each type. (8)

Or

(b) (i) What are epoxy resins? Mention any one method of preparation of epoxy resins. What are its uses? (8)

(ii) What is vulcanization? Discuss the mechanism of vulcanization of rubber. (8)

13. (a) (i) What are the characteristics of wet corrosion? Discuss the mechanism of corrosion by hydrogen evolution type. (8)

(ii) How will you control corrosion by cathodic protection methods? Explain. (8)

Or

(b) (i) What are drying oils? Discuss the mechanism of drying of an oil paint. (8)

(ii) Write a brief note on (1) Luminous paints (2) Fire-retardant paints. (4 + 4)

14. (a) (i) Describe the principle and process involved in the zeolite method for the treatment of water. What are the limitations of this method? (8)

(ii) What is desalination? With a neat sketch explain the electrodialysis method. (8)

Or

(b) (i) How will you purify water for drinking purposes? Give the various steps involved. (8)

(ii) Discuss the problems associated with the use of hard water in industries. (8)

15. (a) (i) How will you carry out ultimate analysis of coal? Explain. (8)

(ii) With a neat sketch, explain the process involved in the synthesis of petrol by Fischer-Tropsch method. (8)

Or

(b) (i) With a neat diagram, describe the manufacture of water gas (8)

(ii) Explain the terms :

(1) Gross and net calorific value (2 + 2)

(2) Octane Number (2)

(3) Cracking. (2)