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T 3192

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Second Semester

(Regulation 2004)

Chemical Engineering

CY 1154 — CHEMISTRY — II

(Common to Polymer Technology, Textile Technology (Fashion Technology) and
Petroleum Engineering)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is LCAO method?
2. What are the postulates of band theory?
3. What is thermocole? Give two uses of it.
4. What is meant by degree of polymerization?
5. State Pilling-Bedworth rule.
6. What is pitting corrosion?
7. Define degree of hardness.
8. What is sedimentation?
9. What are antiknock compounds?
10. What are the fractions obtained by the refining of petroleum?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain bond order and bond energy. (3)
(ii) Explain coordinate bond with examples. (5)
(iii) Explain dipole-dipole and dipole-induced dipole interactions. (8)

Or

- (b) (i) Discuss the application of crystal field theory to square planar complexes. (8)
(ii) Give an account of the industrial applications of coordination compounds. (8)
12. (a) (i) Explain the various types of polymerizations with examples. (8)
(ii) Give an account of the preparation, properties and uses of PE and PMMA. (8)

Or

- (b) (i) How is rubber vulcanized? What are the advantages of vulcanization? (6)
(ii) What are the characteristics of thermosetting resins? Give the preparation, properties and uses of any two thermosetting resins. (10)
13. (a) (i) Explain any two types of chemical corrosion with examples. (6)
(ii) Discuss the mechanism of electrochemical corrosion. (10)

Or

- (b) (i) Explain corrosion control by cathodic protection and sacrificial anode methods. (8)
(ii) Give an account of special paints. (8)
14. (a) (i) One litre of a sample of water is found to contain 40.5mg of $\text{Ca}(\text{HCO}_3)_2$, 46.5mg of $\text{Mg}(\text{HCO}_3)_2$, 27.6mg of MgSO_4 , 32.1mg of CaSO_4 and 22.45mg of CaCl_2 . Calculate the total hardness of the water sample. (8)
(ii) Explain zeolite process. (8)

Or

- (b) (i) Explain calgon conditioning. (4)
- (ii) Explain reverse osmosis. (6)
- (iii) Explain any two methods of disinfection of water. (6)
15. (a) (i) Explain proximate analysis of coal. (6)
- (ii) How is metallurgical coke manufactured? (4)
- (iii) Calculate the gross calorific value of 5kg of coal containing 85%C, 8%H, 1%S, 2%N and remaining ash. (6)

Or

- (b) (i) How is water gas manufactured? What are its uses? (4)
- (ii) Explain Fischer-Tropsch process. (8)
- (iii) Calculate the amount of air required for the complete combustion of 5kg of methane. (4)