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

S 4027

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Second Semester

Chemical Engineering

CY 1154 — CHEMISTRY — II

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

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is LCAO method?

2. Mention any two industrial applications of co-ordination compounds.

3. What is meant by degree of polymerization?

4. How is TEFLON prepared? What are its uses?

5. What is sacrificial anode?

6. What are luminous paints?

7. Define degree of hardness.

8. What is reverse osmosis?

9. What is meant by ultimate analysis of coal?

10. Define octane number.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain hydrogen bonding and its applications with suitable examples. (8)

(ii) Sketch the molecular orbital diagram of O_2 molecule. Explain its paramagnetic nature. (8)

Or

(b) (i) Discuss the application of crystal field theory to octahedral complexes. (10)

(ii) Explain the various electrical properties of elements using band theory. (6)

12. (a) (i) Discuss the various types of polymerization reactions with suitable examples. (8)

(ii) What is meant by vulcanization of rubber? How it modifies the structure of rubber? What are its effects on the properties of rubber? (8)

Or

(b) (i) Give an account of the preparation, properties and uses of bakelite. (6)

(ii) Discuss the synthesis, properties and uses of any two polyamides. (10)

13. (a) (i) Explain chemical corrosion with examples. (6)

(ii) Discuss the various factors which influence corrosion. (10)

Or

(b) (i) Explain the control of corrosion by selection of material and proper designing with suitable examples. (6)

(ii) Give an account of the various constituents of paint. Explain the function of each. Explain the mechanism of drying. (10)

14. (a) (i) Explain the disadvantages of using hard water in industries. (6)

(ii) Outline the ion exchange method of removal of hardness. (6)

(iii) Explain the phosphate conditioning process. (4)

Or

(b) Explain the various stages of treatment of drinking water. (16)

15. (a) (i) Explain proximate analysis of coal. (6)

(ii) How is metallurgical coke prepared? What are its requirements? What are its uses? (10)

Or

(b) (i) A coal has 85% C, 8% H, 1% S, 2% N and remaining ash. Calculate the net heat liberated by the burning of 5 kg of coal. (latent heat of vapourisation of water is 587 cal/g). (8)

(ii) Explain the working of Orsat apparatus. (8)