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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

Second Semester

Civil Engineering

CY 1152 — CHEMISTRY — II

(Regulations 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Of the species O_2, O_2^+, O_2^- and O_2^{2-}, which would have the maximum bond strength?

2. What is meant by crystal field splitting?

3. Why is Teflon chemical by resistant?

4. Thermoplastic materials are more soluble in organic solvents when compared with thermo setting polymer why?

5. What are the inhibitors used for corrosion prevention? How do they function?

6. How may an oil paint be rendered luminous?

7. What is Sorrel cement?

8. How is RUL performed?

9. What is electrodialysis?

10. What is break point chlorination?

PART B — (5 × 16 = 80 marks)

11. (i) Explain the setting and hardening of Portland cement. (8)

(ii) Describe the manufacture and applications of (1) Silica bricks (2) Magnesite bricks. (8)

12. (a) (i) On the basis of the MO approach, show that (1) NO and NO^- are both paramagnetic (2) NO^+ and N_2 are both diamagnetic. (8)

(ii) Explain the industrial applications of coordination complexes. (8)

Or

(b) (i) Discuss hydrogen bonding and explain why density of ice is less than that of water. (8)

(ii) Give the structure of $[Ni(CN)_4]^{2-}$ ion with help of orbital diagram. (8)

13. (a) (i) Distinguish between the following examples :

(1) Natural and synthetic rubber

(2) Addition and condensation polymerization

(3) Thermoplastic and thermosetting resins. (8)

(ii) Discuss the method of preparation and properties of (1) Plexiglass (2) Teflon. (8)

Or

(b) (i) Discuss the mechanism of addition polymerisation. (8)

(ii) (1) What is meant by vulcanization of rubber? Why is it essential? (4)

(2) State two uses of (A) Polystyrene (B) PVC. (4)

14. (a) (i) Discuss the mechanism of electrochemical corrosion. (8)

(ii) Describe the mechanism of drying of the oil used as vehicle in a paint. (8)

Or

(b) (i) What is stress corrosion? Give two examples. How can it be controlled? (8)

(ii) Write a notes on :

(1) Luminescent paint

(2) Fire–retardent paint

(3) Temperature–indicating paint. (8)

15. (a) (i) Explain :

(1) Phosphate conditioning

(2) Sedimentation with coagulation. (8)

(ii) Describe the principle and procedure involved in the zeolite process for the treatment of water. What are the limitations, advantages and disadvantages of the process? (8)

Or

(b) (i) What is the purpose of softening water? What are the different chemicals used for this purpose? Explain chlorination and dechlorination. (8)

(ii) What is desalination? Name the different methods of desalination. Explain any one in detail. (8)

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