

**C 3165**

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

Second Semester

Civil Engineering

CY 1152 — CHEMISTRY — II

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Account for and identify the forces responsible for the solubilities of HCl gas and O<sub>2</sub> gas in water.
2. What explanation does MO theory offer for the presence of valence and conduction bands in metals?
3. List out the various ways by which polymers can be classified.
4. Write the mechanism of formation of an isotactic polymer using a Zeigler Natta catalyst.
5. Corrosion of a metal is the highest at the metal junction in a galvanic couple— Account the reason.
6. State the basic design rules in controlling corrosion.
7. Give the compositions and applications of white Portland cement and water proof cement.
8. How are refractories classified? Give one example to each class.
9. Compare zeolite and ion exchange resin methods of treatment of water.
10. Distinguish between coagulation and flocculation. List the common coagulants and flocculants used in water and wastewater treatment.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw the molecular orbital energy level diagram of O<sub>2</sub> molecule and discuss. (5)
- (ii) Bring out the applications of coordination complexes in plating industry. (5)
- (iii) Describe the experimental set up to determine the magnetic susceptibility of complexes. (6)

Or

- (b) (i) Discuss the crystal field theory. Bring out its merits over VB theory. (10)
- (ii) Write a note on metallic bonding. (6)
12. (a) (i) How do structure and tacticity of polymers affect their thermal, mechanical and electrical structures? (10)
- (ii) Write the preparation properties and applications of Teflon and Polystyrene. (6)

Or

- (b) (i) Write the mechanism of free radical polymerisation. (5)
- (ii) How is PMMA prepared? Write its optical and other applications. (5)
- (iii) Write on the different classes of synthetic rubbers. What is the structural requirement of a polymer to be an elastomer? (6)
13. (a) (i) What are the metallurgical and environment factors affecting corrosion rate of a metal? How will you alter these suitably to control corrosion? (10)
- (ii) Write the autocatalytic mechanism of pitting corrosion. (6)

Or

- (b) (i) Write notes on :
- (1) Applications of corrosion inhibitors (5)
- (2) Cathodic protection methods. (5)
- (ii) List out the various constituents of paints and explain their functions. (6)

14. (a) (i) Briefly discuss the preparation and applications of fibre reinforced plastics. (10)
- (ii) What are the types of lime? Write the mechanism of setting and hardening of lime. (6)

Or

- (b) (i) Give a comparison of metal matrix composites and ceramic matrix composites. (5)
- (ii) Bring out the preparation, properties and applications of carborundum. (5)
- (iii) Write notes on weathering of concrete and its prevention. (6)
15. (a) (i) Explain the ion exchange resin method of treatment of water. (8)
- (ii) What are the advantages and disadvantages of chlorination of water? What is meant by breakpoint chlorination? (8)

Or

- (b) (i) Write an account on the different internal conditioning methods of boiler feed water. (10)
- (ii) Explain reverse osmosis process in detail. (6)
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