D 51213 (Pages 2) Name.....

Reg. No.....

COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2008

Chemistry

EN 2K 104 (A)—ENGINEERING CHEMISTRY (A)

(Common to AI, CS, EE, EC, IT and IC)

Time : Three Hours Maximum : 100 Marks

I. (a) What are ionic, molecular and covalent crystals ?

(b) State free electron theory.

(c) Write short note on buffer solutions.

(d) What is common ion effect ? Give any *two* uses of it.

(e) Explain what happens if a pipeline is partially buried under the earth surface.

(f) How does combustion of engine cause are pollution ?

(g) What is latex ? How is it obtained and processed ?

(h) Write short note on extreme pressure lubrication.

(8 × 5 = 40 marks)

II. (a) (i) What are the different types of bonds present in crystalline solids ? Give an example for each type. (7 marks)

(ii) Derive Bragg's equation for diffraction of X-rays by crystals. (8 marks)

Or

(b) (i) Why is the diamond so hard and why is its melting point extremely high ? (7 marks)

(ii) Explain the term Miller indices. What is the law of rational indices ? Give its application. (8 marks)

III. (a) (i) Derive Nernest equation and mention its application. (7 marks)

(ii) Describe the standard hydrogen electrode and its use in the determination of single electrode potential. (8 marks)

Or

Turn over

(b) (i) What is meant by electrochemical series ? Discuss its application. (7 marks)

(ii) How is overvoltage experimentally determined ? Discuss the influence of overvoltage in metal depositions. (8 marks)

IV. (a) (i) Explain the principle of electrochemical corrosion with suitable example. (7 marks)

(ii) Describe the impressed current and sacrificial anode methods of corrosion controls. (8 marks)

Or

(b) (i) Discuss the mechanism of galvanic cell corrosion with an example. Give the possible corrosion reactions in acid and neutral conditions. (8 marks)

(ii) What is atmospheric corrosion ? Discuss the factors influencing atmospheric corrosion. (7 marks)

V. (a) (i) How would you classify polymers based on sources and applications ? (7 marks)

(ii) Describe the mechanism of addition polymerisation. (8 marks)

Or

(b) (i) Discuss the mechanism of co-ordination polymerisation. (8 marks)

(ii) Write a note on "solid lubricants". (7 marks)

[4 × 15 = 60 marks]