



C-14-A/AA/BM/CHST/AEI/FW/MET/MNG/IT/TT/PKG/PPT-104

4004

BOARD DIPLOMA EXAMINATION, (C-14)

APRIL/MAY—2015

FIRST YEAR (COMMON) EXAMINATION

ENGINEERING CHEMISTRY AND
ENVIRONMENTAL STUDIES

Time : 3 hours]

[*Total Marks* : 80

PART—A

3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Draw the shapes of *p*- and *d*-orbitals.
2. Define oxidation and reduction with one example each.
3. Define mole. Calculate the number of moles present in 90 gram of H₂O.
4. What is conjugate acid-base pair? Give an example.
5. Define standard electrode potential and emf.
6. What is osmosis? Give an example.
7. Give the preparation method and uses of (a) Teflon, and (b) PVC.

- * 8. What are the characteristics of a good fuel?
9. Write a short note on acid rain.
10. Define producers, consumers and decomposers.

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.
 (2) Each question carries **ten** marks.
 (3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) Write about electronic theory of valency. 5
 (b) What is electronic configuration? Explain Aufbau principle and Hund's rule. 5
12. (a) What is molarity? Calculate molarity of 500 ml NaOH solution containing 6 gram of NaOH. (At. Wts. : Na-23; O-16; H-1) 5
 (b) Write about Lewis theory of acids and bases. What are its limitations? 5
13. (a) Define the terms (i) ore, (ii) mineral, (iii) slag, (iv) gangue, and (v) flux. 5
 (b) What is levigation? 3
 (c) What is an alloy? What are the advantages of alloying? Give examples. 2
14. (a) Distinguish between electrolytic cell and galvanic cell. 3
 (b) What is electrolysis? Explain electrolysis of fused NaCl. 4
 (c) The standard reduction potentials of zinc electrode and copper electrode are -0.76 V and $+0.34$ V respectively. Find the standard e.m.f. of the following cell : 3

$$\text{Zn} | \text{Zn}^{2+} (1 \text{ M}) || \text{Cu}^{2+} (1 \text{ M}) | \text{Cu}$$

- * 15. (a) What is electrochemical theory of corrosion? Explain the formation of stress cell. 5
- (b) What is cathodic protection? Explain the sacrificial anode method of preventing corrosion. 5
16. (a) Describe ion-exchange method to soften hard water. 7
- (b) Differentiate between temporary hardness and permanent hardness. 3
17. (a) Define plastics. What are the characteristics of plastics? 5
- (b) What is vulcanization? Explain the process. 5
18. (a) What is air pollution? What are the causes of air pollution? 5
- (b) Write notes on (i) depletion of ozone layer, and (ii) greenhouse effect. 5
