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BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL—2014

DCME—FIRST YEAR 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. Define orbital. Draw the shapes of *d*-orbital.
2. Write any three properties of covalent compounds.
3. Define molarity. Find the molarity of solution containing 171 g of sugar in 1000 ml of solution. (Mol. wt. of sugar is 342.)
4. What is conjugate acid-base pair? Give two examples.
5. Define electrochemical equivalent and chemical equivalent.
6. Define osmosis and reverse osmosis.
7. What are elastomers? Write any two uses of buna and neoprene.
8. What are the characteristics of good fuels?
9. Define the terms 'producers', 'consumers' and 'decomposers'.
10. Write a short note on ozone layer depletion.

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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) Define and explain (i) Aufbau principle and (ii) Hund's rule. 6
 (b) What are the differences between valency and oxidation number? 4
- 12.** (a) Define normality. Find the weight of Na_2CO_3 present in 100 ml of 0.2 N solution. 1+4
 (b) Explain Arrhenius theory of acids and bases. What are its demerits? 4+1
- 13.** (a) Define and explain calcination and roasting. 3+3
 (b) Explain electrolytic refining of metals. 4
- 14.** (a) What is electrochemical series? What is its significance? 2+4
 (b) Define electromotive force. Calculate the e.m.f. of the cell $\text{Zn}|\text{Zn}^{2+}|\text{Cu}^{2+}|\text{Cu}$ standard reduction potentials of $\text{Zn}^{2+}|\text{Zn}$ and $\text{Cu}^{2+}|\text{Cu}$ electrodes are -0.76 V and +0.34 V respectively. 1+3
- 15.** (a) Write a short note on protective coatings. 4
 (b) Explain composition cell and stress cell. 6
- 16.** (a) What are essential qualities of drinking water? 4
 (b) Explain the method of treatment of water for drinking purpose. 6
- 17.** (a) Write any six differences between thermoplastics and thermosetting plastics. 6
 (b) Write preparation and any two uses of the following plastics : 4
 (i) Polyethylene
 (ii) Polystyrene
- 18.** (a) Define water pollution. Explain any three causes of water pollution. 1+6
 (b) What are the effects of water pollution? 3
