



c09-c-104

**3014**

**BOARD DIPLOMA EXAMINATION, (C-09)**

**OCT/NOV—2014**

**DCE—FIRST YEAR EXAMINATION**

**ENGINEERING CHEMISTRY AND  
ENVIRONMENTAL STUDIES**

*Time : 3 hours ]*

*[ Total Marks : 80*

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**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. State three limitations of Bohr's atomic theory.
2. Calculate the oxidation number of Mn in  $\text{MnO}_2$  and  $\text{KMnO}_4$ .
3. Define the terms (a) mole, (b) molality and (c) normality.
4. Define pH. Find the pH of 0.001 N HCl solution.
5. Define the terms (a) electrolyte, (b) electrolysis and (c) electrode potential.
6. Give the formulae of the salts responsible for temporary hardness and permanent hardness of water.
7. Give any three advantages of plastics over traditional materials.
8. Give the composition and two uses of water gas.
9. Define the terms BOD and COD.
10. What are primary pollutants and secondary pollutants? Give examples.

**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 ionic bond. Explain the formation of ionic bond in sodium chloride. 6  
(b) Write any four properties of covalent compounds. 4
- 12.** (a) 9.8 gm of  $H_2SO_4$  is dissolved in two litre of water. Calculate the normality of the solution. 5  
(b) What are buffer solutions? Give their uses. 5
- 13.** (a) Write any four differences between metals and non-metals. 4  
(b) Explain roasting and calcination giving examples. 6
- 14.** (a) What are electrochemical equivalent and chemical equivalent? How are they related? 6  
(b) Write any four differences between an electrolytic cell and a galvanic cell. 4
- 15.** (a) Explain the factors that influence the rate of corrosion. 5  
(b) Describe the impressed voltage method of prevention of corrosion. 5
- 16.** (a) Explain briefly ion-exchange method of softening hard water giving chemical equations. 8  
(b) Define reverse osmosis. 2
- 17.** (a) Give a method of preparation and two uses of (i) PVC and (ii) polystyrene. 6  
(b) What are the characteristics of vulcanized rubber? 4
- 18.** (a) Define water pollution and explain any four causes of water pollution. 6  
(b) Write a brief note on acid rain. 4

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