



C-14-CHOT/M/RAC-104

4052

BOARD DIPLOMA EXAMINATION, (C-14)

APRIL/MAY—2015

DME—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 oxidation state. Calculate the oxidation state of P in  $\text{H}_3\text{PO}_4$  and C in  $\text{H}_2\text{CO}_3$ .
2. Draw *d* orbital structures.
3. Define unsaturated solution, saturated solution and super-saturated solution.
4. Calculate the concentration of  $\text{H}^+$  ions in moles per litre of an acid if pH is 3.75.
5. What are the disadvantages of using hard water in industries?
6. Define conductor and electrolyte.
7. State any three differences between addition polymerization and condensation polymerization.
8. Mention the characteristics of a good fuel.
9. Write a note about ozone depletion.
10. What are the threats to biodiversity?

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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) Explain about ionic bond formation with an example. 6  
(b) Explain the formation of metallic bond with electron sea model theory. 4
- 12.** (a) 4.9 g of solute present in 250 ml of H<sub>2</sub>SO<sub>4</sub> solution. Calculate the molarity and normality of resulting solution. 5  
(b) Explain Bronsted-Lowry theory of acids and bases. 5
- 13.** (a) Explain roasting and calcination of ore. 6  
(b) Write the composition and uses of brass and nichrome alloys. 4
- 14.** (a) State the differences between electrolytic cell and galvanic cell. 6  
(b) Define electrochemical series and write the significance of it. 4
- 15.** (a) Explain the formation of composition cell and concentration cell in corrosion. 4  
(b) Explain the sacrificial anode method and impressed voltage method of protecting metal from corrosion. 6
- 16.** (a) What are the essential qualities of drinking water? 4  
(b) Define hardness. Explain Permutit process of softening of hard water. 6
- 17.** (a) Write a note on condensation polymerization with an example. 4  
(b) Write the preparation method of Butyl rubber, Buna-S and Neoprene rubber. 6
- 18.** (a) Write the causes of water pollution. 5  
(b) Write the methods adopted to control water pollution. 5

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