



C14-EC/CHPC/PET-104

4036

BOARD DIPLOMA EXAMINATION, (C-14)

OCT/NOV—2015

DECE—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. Draw the shapes of *s* and *d* orbitals.
2. Write any three properties of ionic compounds.
3. Define mole. Calculate the number of moles present in one kilogram of  $\text{CaCO}_3$ .
4. What is conjugate acid-base pair? Give an example.
5. Explain Faraday's second law of electrolysis.
6. Define reverse osmosis and write two of its advantages.
7. Write a method of preparation of polyvinyl chloride (PVC). Give chemical equation.
8. Define fuel. Classify the fuels based on their occurrence.
9. Write a note on acid rains.
10. Define the terms (a) producers, (b) consumers and (c) 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 the significance of quantum numbers. 6  
(b) Explain the formation of covalent bond in hydrogen and oxygen molecules using Lewis dot model. 4
- 12.** (a) Define molarity. Calculate the volume of water to be added to 250 ml of 0.5 M Na<sub>2</sub>CO<sub>3</sub> solution to get 0.01 M Na<sub>2</sub>CO<sub>3</sub> solution. 5  
(b) Explain Arrhenius acid base theory. 5
- 13.** (a) Explain froth floatation process of concentration of ore. 6  
(b) Give the composition and two uses each of the following alloys : 4  
(i) Brass  
(ii) Nichrome
- 14.** (a) A current of 0.5 amp is passed through molten AlCl<sub>3</sub> for 96.5 seconds. Calculate the mass of aluminum deposited on the cathode (At. wt. of Al = 27) 5  
(b) Write any five differences between electrolytic cell and galvanic cell. 5
- 15.** (a) Explain any five factors influencing the rate of corrosion. 5  
(b) Describe sacrificial anode method of prevention of corrosion. 5
- 16.** (a) Explain ion-exchange method of softening of hard water. 6  
(b) List the chemical compounds with their formulae, which causes hardness. 4
- 17.** (a) What is addition and condensation polymerization? Explain with examples. 6  
(b) Explain the process of vulcanization of rubber. 4
- 18.** (a) State and explain any three control methods of air pollution. 6  
(b) Write a note on ozone layer depletion. 4

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