C14–EC/CHPC/PET–**104**

4036

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2015
DCE—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 $CaCO_3$.

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.

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_2CO_3 solution to get 0·01 M Na_2CO_3 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 $AlCl_3$ 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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