4017

BOARD DIPLOMA EXAMINATION, (C–14)
APRIL/MAY—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) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Write a short note on metallic bond.

2. State and explain Hund's rule.

3. Define mole. Calculate the no. of moles present in 90 gm of water.

4. State any three limitations of Arrhenius theory of acids and bases.

5. Define e.m.f. The standard reduction potential values of calcium and lead (plumbum) electrodes of a cell are –2.9 V and –0.12 V respectively. Calculate the e.m.f. of the cell Ca / Ca^2 $// Pb^2 / Pb$.

6. Define soft water and hard water.

7. Write the preparation method and two uses of Buna-S rubber.

8. State any three characteristics of good fuel.

9. What are primary and secondary pollutants? Give examples.

10. Write a short note on renewable energy sources.

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 postulates of Bohr's atomic model.   6

    (b) State any four properties of covalent compounds.   4

12. *(a)* Classify solutions based on physical state with suitable examples.   5

    (b) Define buffer solution. What are different types of buffer solution? Give examples.   5

13. *(a)* Write any five differences between electrolytic cell and galvanic cell.   5

    (b) State Faraday's 1st law of electrolysis. A current of 2 amperes is passed through $CuSO_4$ solution for 20 minutes. Calculate the weight of copper deposited at cathode. (At. wt. of Cu = 63.5)   5

14. *(a)* Describe froth floatation process for concentration of ore.   5

    (b) Explain the electrolytic refining of crude metals.   5

15. *(a)* State any six factors which influence the rate of corrosion.   6

    (b) Explain the cathodic protection by impressed voltage method.   4

16. *(a)* Describe the method of removal of hardness of water by permutit process. 6

(b) Mention any four disadvantages of using hard water in industries. 4

17. *(a)* Write a method of preparation and two uses of the following plastics : 5

(i) Polythene

(ii) Ureaformaldehyde

(b) Distinguish between thermoplastics and thermosetting plastics. 5

18. *(a)* Write short notes on the following : 6

(i) Greenhouse effect

(ii) Acid rain

(b) Explain any two control methods of air pollution. 4

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