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C09–CHOT–104/C09–M–104/C09–RAC–**104**

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2014

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. State any three properties of covalent bond.

2. Distinguish between oxidation number and valency.

3. Calculate the weight of NaOH required to prepare 250 ml of 0·2 molar solution.

4. What is conjugate acid-base pair? Explain with an example.

5. Write the significance of electrochemical series.

6. Define *(a)* soft water, *(b)* hard water and *(c)* degree of hardness.

7. Write any six characteristics of plastics.

8. Give the composition and two uses of water gas.

9. What are the effects of deforestation?

10. Define the following terms with examples :

(a) Producers

(b) Consumers

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)* State modern periodic law. Write the salient features of modern periodic table. 6

(b) Calculate the oxidation number of Mn in (i) $KMnO_4$ and (ii) MnO_2. 4

12. *(a)* Discuss Bronsted-Lowry acid-base theory. 5

(b) Define the terms *(i)* solute, *(ii)* solvent, *(iii)* solution and *(iv)* mole with suitable example. 1+1+1+2=5

13. *(a)* Distinguish between metals and nonmetals. 6

(b) What is calcination? Explain with an example. 4

14. *(a)* Explain Faraday's laws of electrolysis. 6

(b) The Zn/Zn^2 standard electrode potential is 0 76 V and for Cu^2 /Cu standard electrode potential is 0 34 V. Calculate the EMF of the cell Zn/Zn^2 //Cu^2 /Cu. 4

15. *(a)* Describe the formation of *(i)* stress cell and *(ii)* concentration cell. 6

(b) Explain the mechanism of rusting of iron. 4

16. *(a)* Explain Permutit process for softening of hard water with a neat diagram. 6

(b) Write the essential qualities of drinking water. 4

17. *(a)* What is addition polymerization? Describe the formation of polyethylene. 5

(b) Write the characteristics of natural rubber. 5

18. *(a)* Discuss about the nonrenewable energy sources. 5

(b) Write the causes of water pollution. 5

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