* 3004 *

C09–A–104/C09–AA–104/C09–AEI–104/C09–BM–104/
C09–C–104/C09–CM–104/C09–CHPP–104/C09–CHPC–104/
C09–CHOT–104/C09–CHST–104/C09–EC–104/C09–EE–104/
C09–IT–104/C09–M–104/C09–MET–104/C09–MNG–104/
C09–PET–104/C09–TT–104/C09–RAC–104

3004

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2015

FIRST YEAR (COMMON) 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. Write the electronic configurations of Cr, Fe and Zn.

2. Calculate the oxidation number of Mn in $KMnO_4$ and Cl in $KClO_3$.

3. Define the term mole. Calculate the weight of 5 moles H_2SO_4.

4. Define buffer solution. Give any two applications of the buffer solutions.

5. What are the salts causing hardness of water. Give the formulae of them.

6. State the advantages of the plastics over the traditional materials.

7. What are the characteristics of good fuels?

8. When a current of 4 amperes is passed through silver nitrate solution for 20 minutes, 5·372 grams of silver is deposited. Calculate the electrochemical equivalent of silver.

9. What is deforestation? What are its effects?

10. What are the biotic and abiotic components? Give examples.

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 and limitations of Bohr's atomic model. 7

(b) Define covalent bond. Explain with two examples. 3

12. *(a)* Define normality and molarity. Give the equations to find them. 5

(b) Calculate the normality of the solution containing 11·2 grams KOH in 1 litre solution (Mol. weight KOH = 56). 5

13. *(a)* Write the characteristics of metals. 4

(b) Define *(i)* roasting, *(ii)* calcination and *(iii)* smelting. Give one example in each case. 6

14. *(a)*

Explain the construction and working of galvanic cell with a neat diagram. 6

(b) Calculate the EMF of the following galvanic cell :

$$Cd / Cd^{2}_{(1M)} / /Sn^{2}_{(1M)} / Sn$$

The SRP of Cd 0 40 V and the SRP of Sn 0 14 V. 4

15. *(a)* Explain the prevention of corrosion by impressed voltage method. 6

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

16. *(a)* Describe the softening of water by ion-exchange method. 7

(b) A sample of water contains 6 grams of $MgSO_4$ per 100 kg of water. What is its degree of hardness? 3

17. Give the preparation and uses of the following : 10

(a) Polythene

(b) Urea-formaldehyde

(c) Polystyrene

(d) Teflon

(e) PVC

18. *(a)* Define producers, consumers and decomposers, and give examples in each case. 6

(b) Explain the effects of air pollution. 4

★ ★ ★