C–14–A/AA/BM/CHST/AEI/MET/

MNG/IT/TT–**104**

4004

BOARD DIPLOMA EXAMINATION, (C–14)

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 any three differences between orbit and orbital.

2. State any three postulates of electronic theory of valancy.

3. Calculate the number of molecules present in 4·5 grams of water.

4. Define buffer solution. Give examples.

5. State Faraday's first law and give its expression.

6. Define degree of hardness. Give its units.

7. Define addition polymerisation. Give the chemical equation for the formation of Teflon.

8. Write the composition and uses of water gas.

9. Define the terms *(a)* producers, *(b)* consumers and *(c)* decomposers.

10. Write any three effects of ozone layer depletion.

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PART—B   10×5=50

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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)* Define coordinate covalent bond. Explain with example.   4

(b) Explain *(i)* Aufbau principle, *(ii)* Hund's rule, *(iii)* Pauli's principle with examples.   6

12. *(a)* Define molarity. Calculate the molarity of a solution containing 6·3 grams of oxalic acid ($H_2C_2O_4 2H_2O$) in 500 ml solution.   5

(b) Explain Bronsted-Lowry theory of acids and bases.   5

13. *(a)* Define *(a)* mineral, *(b)* ore, *(c)* gangue, *(d)* flux and *(e)* slag.   5

(b) Describe froth flotation process.   5

14. *(a)* Explain the construction and working of galvanic cell with neat diagram.   6

(b) Define EMF. Calculate the EMF of the following cell :   4

<div align="center">

$Zn \mid Zn^2$ (1M) $\mid\mid Cu^2$ (1M) $\mid Cu$

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Given $Zn^2 \mid Zn$ = –0·76 volts $Cu^2 \mid Cu$ = +0·34 volts

15. *(a)* Explain the mechanism of rusting of iron.   5

(b) Write any five factors that influence the rate of corrosion.   5

16. *(a)* Define condensation polymerisation. Explain the formation of Bakelite.   5

     (b) Write any five advantages of plastic over traditional materials.   5

17. *(a)* Explain any four disadvantages of hard water using in industries.   4

     (b) Describe the softening of hard water by ion exchange process with neat diagram.   6

18. *(a)* Explain any three methods to control air pollution.   5

     (b) Define the following terms :   5

        (i) Pollution

        (ii) BOD

        (iii) COD

        (iv) TLV

        (v) Contaminant

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