C16–A/AA/BM/CHST/AEI/MET/
MNG/TT/IT—**104**

6004

BOARD DIPLOMA EXAMINATION, (C–16)

MARCH/APRIL—2018

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. State and explain Hund's rule with example.

2. Write the electronic configuration of copper, chromium and zinc.

3. Define solute, solvent and solution.

4. What is ionic product of water? Give the equation.

5. Calculate the e.m.f. of the cell

$$Zn|Zn^2 \| Cu^2 \| Cu$$

$$E^\circ_{Zn^2 |Zn} \quad 0.76 \text{ V}, \ E^\circ_{Cu^2 |Cu} \quad 0.34 \text{ V}$$

6. Write the name and formula of hardness causing substances.

7. What are the characteristics of plastics?

8. Write the composition and uses of producer gas and water gas.

9. Explain the following terms :

(a) Biotic component

(b) Abiotic component

10. Write a short note on acid rain.

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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 covalent bond. Explain covalent bond in H_2, O_2, N_2 molecules.   5

(b) Explain about quantum numbers.   5

12. (a) Define normality. Calculate the normality of a solution containing 5·3 g of sodium carbonate in 250 ml of solution.   5

(b) Explain the concept of Arrhenious theory of acids and bases with examples.   5

13. (a) State any five differences between metals and non-metals.   5

(b) Explain froth floatation process of concentration of ore.   5

14. *(a)* State and explain the Faraday's law of electrolysis.   6

   (b) Define e.m.f. of the cell. How is it calculated?   4

15. *(a)* What is rust? Explain the rusting of iron with chemical equation.   5

   (b) Explain the sacrificial anode method with examples.   5

16. *(a)* What are the essential qualities of drinking water?   5

   (b) Calculate the temporary and permanent hardness of a sample water containing the following per litre :   5
   (i) $CaSO_4$ = 13·6 mg
   (ii) $MgSO_4$ = 12·0 mg
   (iii) $Mg(HCO_3)_2$ = 7·3 mg
   (iv) $Ca(HCO_3)_2$ = 16·2 mg
   (v) $MgCl_2$ = 9·5 mg
   (vi) $CaCl_2$ = 11·1 mg

17. *(a)* What is vulcanization of rubber? Explain with chemical equation?   5

   (b) Distinguish between addition polymerization and condensation polymerization.   5

18. *(a)* Explain the control methods of air pollution.   5

   (b) What is deforestation? Explain the causes of deforestation.   5

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