C16–EC–104/C16–CHPC–104/C16–PET–**104**

6030

BOARD DIPLOMA EXAMINATION, (C–16)
OCT/NOV—2017
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) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define orbital. Draw the shapes of *s* and *p* orbitals.

2. Write any three differences between ionic compounds and covalent compounds.

3. Define mole. Calculate the number of moles in 9 grams of H_2O.

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

5. Define electrochemical equivalent (*e*) and chemical equivalent (*E*). Give their relation.

6. Write the salts responsible for temporary and permanent hardness.

7. What are plastics? Write any two advantages of plastics over traditional materials.

8. Mention any three characteristics of good fuel.

9. Define COD, BOD and pollutant.

10. What are renewable and non-renewable energy sources? 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 important postulates of Bohr's atomic theory.   5

(b) Define oxidation state. Calculate the oxidation states of *(i)* Mn in $KMnO_4$ and *(ii)* S in H_2SO_4.   5

12. *(a)* Define molarity. Find the molarity of solution containing 4 grams of NaOH in 500 ml of solution.   5

(b) Explain Arrhenius theory of acids and bases.   5

13. *(a)* Explain Froth flotation process.   5

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

14. *(a)* State and explain Faraday's laws of electrolysis.   5

(b) Define e.m.f. Calculate the e.m.f. of the cell

$$Zn / Zn^2 \ (1\,M) // Cu^2 \ / Cu\,(1\,M)$$

Given that $E_{Zn^2/Zn}$ 0 76V, $E_{Cu^2/Cu}$ 0 34V.   5

15. *(a)* Define and explain the formation of composition cell and stress cell.   5

(b) Explain sacrificial anode method.   5

16. *(a)* Explain softening of hard water by Permutite process.   5

(b) Define osmosis and reverse osmosis. State any three advantages of reverse osmosis.   5

17. *(a)* Write any five differences between thermoplastics and thermosetting plastics.   5

(b) Write any five characteristic properties of vulcanized rubber.   5

18. *(a)* Define air pollution. Write any four causes of air pollution.   5

(b) Write short notes on *(i)* greenhouse effect and *(ii)* ozone layer depletion.   5

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