

TED (10)–1003 B

(REVISION—2010)

Reg. No.

Signature

FIRST SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY—OCTOBER, 2013

APPLIED SCIENCE—I (Chemistry)
(Common except DCP and CABM)

[Time : 1½ hours

(Maximum marks : 50)

Marks

PART—A

(Maximum marks : 4)

I Answer the following questions in one or two sentences. Each question carries 2 marks.

- (a) Explain neutralization reaction. Give one example.
(b) Define soft water.

(2×2=4)

PART—B

(Maximum marks : 16)

II Answer any two full questions. Each question carries 8 marks.

- (a) Magnesium metal burns in oxygen to form magnesium oxide (MgO) as per the equation : $Mg + O_2 \rightarrow MgO$.

How many grams of oxygen are needed to react with 25 g of magnesium ? How many grams of magnesium oxide will result ?

4

- (b) Explain the electronic concept of oxidation and reduction. Give one example.

4

III (a) What are buffer solutions ? Give two examples.

4

- (b) What are carbon nanotubes ? Explain the structure of carbon nanotubes.

4

IV (a) Describe chemical vapour deposition method for the synthesis of carbon nanotube.

4

- (b) Explain ion exchange method.

4

PART—C

(Maximum marks : 30)

(Answer one full question from each unit. Each question carries 15 marks.)

UNIT—I

V (a) Write down the molecular formula of following compounds :

- (i) Sodium sulphate (iii) Potassium carbonate
(ii) Ammonium phosphate (iv) Aluminium chloride.

4

- | | Marks |
|---|-------|
| (b) What is the volume of the solution that would result by diluting 70ml of 0.0913 N NaOH to a concentration of 0.0150 N ? | 4 |
| (c) Explain the Lewis concept of acid and base with an example. | 4 |
| (d) Which indicator you would adopt for the titration of $\text{Na}_2\text{CO}_3 \times \text{H}_2\text{SO}_4$? Give reason. | 3 |

OR

- VI (a) Explain the following terms with two example for each :
- | | | |
|---|-------------------------------|---|
| (i) Radical | (ii) Valency. | 4 |
| (b) What you understand about : | | |
| (i) Strong acid and strong base | (ii) weak acid and weak base. | 4 |
| (c) The sterile saline solution used to rinse contact lenses can be made by dissolving 400 mg. of NaCl in sterile water and diluting to 100ml. What is the molarity of the solution ? | | |
| (d) Balance the following equations : | | |
| (i) $\text{C}_3\text{H}_8 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ | | |
| (ii) $\text{Mg} + \text{HNO}_3 \rightarrow \text{H}_2 + \text{Mg}(\text{NO}_3)_2$ | | |
| | | 3 |

UNIT—II

- VII (a) Draw a flow chart for the production of potable water for municipal supply. 4
- (b) Explain the disadvantages of hard water. 4
- (c) What are the properties of carbon nanotubes ? 4
- (d) Give any three applications of carbon nanotubes. 3

OR

- VIII (a) What are the application of nanomaterials in medicine ? 4
- (b) Explain the reason for temporary hardness and how it can be removed ? 4
- (c) What is sterilization of water ? Mention the different methods of sterilization of water. 4
- (d) Explain Plasma process. 3