

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2018**

APPLIED SCIENCE - I (Chemistry)

[Time : 1½ hours

(Maximum marks : 50)

PART — A

(Maximum marks : 4)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

(a) Write down the molecular formula of two compounds where tin shows variable valency.

(b) How can you distinguish between hard and soft water. (2×2 = 4)

PART — B

(Maximum marks : 16)

(Answer any *two* full questions. Each question carries 8 marks.)

II (a) How many grams of Methane is required to produce 55 g of carbon dioxide by combustion. (At. wt. of C = 12, H = 1, O = 16) 4

(b) Explain redox reaction taking daniel cell as an example. 4

III (a) What are the disadvantages of hard water ? 4

(b) List any four properties of Carbon Nanotubes. 4

IV (a) Define equivalent weight of an acid and a base. 4

(b) Explain the terms :

(i) Standard solution 4

(ii) pH range of indicators. 4

PART — C

(Maximum marks : 30)

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

UNIT — I

- V (a) Calculate the molar masses of the following.
- (i) $\text{Mg SO}_4 \cdot 7\text{H}_2\text{O}$ (ii) $(\text{NH}_4)_2\text{SO}_4$ (iii) $\text{Cu SO}_4 \cdot 5\text{H}_2\text{O}$
- (Atomic weight Mg = 24, S = 32, N = 14, O = 16, H = 1, Cu = 63.5) 6
- (b) Define pH of a solution. List any three applications of pH. 5
- (c) What is a buffer solution ? Give two examples. 4

OR

- VI (a) Write down the molecular formula of the following compounds
- (i) Ammonium phosphate (ii) Aluminum sulphate (iii) Zinc nitrate 6
- (b) Explain Lewis concept of acids and bases with one example. 5
- (c) 250 ml of 0.5 N sulphuric acid and 100 ml of water are mixed together.
Find out the normality of the resulting solution. 4

UNIT — II

- VII (a) What do you mean by temporary hardness of water and explain any one method to remove it showing the chemistry behind it. 6
- (b) What is potable water and list any four properties of potable water ? 5
- (c) What are Carbon Nanotubes ? Name the different varieties of Carbon Nanotubes. 4

OR

- VIII (a) Name the different steps involved in the treatment process of potable water and explain the sterilization of potable water using Chlorine and Ozone. 6
- (b) Explain the ion - exchange method to remove the hardness of water. 5
- (c) List any four applications of Nano materials. 4