TED (10)–1003B

(REVISION—2010)

Reg. No. .....

Signature .....

FIRST SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/ TECHNOLOGY—MARCH, 2012

APPLIED SCIENCE–I (CHEMISTRY)

(Common except DCP and CABM)

[*Time* : 1½ hours

(Maximum marks : 50)

Marks

PART—A

(Answer the questions in one or two sentences. Each question carries 2 marks.)

I 1. Write down the molecular formulae of two compounds where iron shows variable valency. 2

2. What is nanosize ? Name three nanosized materials. 2

(2×2=4)

PART—B

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

II 1. Balance the following equations :

(a) $Mg_3N_2 + H_2O \longrightarrow Mg(OH)_2 + NH_3$

(b) $Al_4C_3 + H_2O \longrightarrow Al(OH)_3 + CH_4$ 4

2. Explain redox reaction taking Daniel cell as an example. 4

III 1. You had a sample of hard water. How can you prepare soft water and deionised water from it ? 4

2. Calculate equivalent weight of H_2SO_4 and Na_2CO_3 using different chemical equations. 4

IV 1. Which indicator will you use in the following titrations ? Why ?

$H_2SO_4 \times Na_2CO_3$

$CH_3COOH \times NaOH$ 4

2. Calculate the weight of Zinc required to produce enough hydrogen to combine completely with 6.4 g of oxygen to form water [At.wt. of Zn = 65.4]. 4

(2×8=16)

PART—C

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

UNIT—I

V 1. Calculate the pH and specify the nature of the following solutions :

(a) $[H^+] = 0.0123$ mol/l.

(b) $[H^+] = 1 \times 10^{-7}$ mol/l.

(c) $[H^+] = 5 \times 10^{-13}$ mol/l. 4

[P.T.O.

Marks

2. Using Arrhenius concept and Lewis concept, describe the neutralisation reaction in acids and bases. 4

3. Mention different units used for expressing the concentration of chemical solutions. 3

4. Propose any two industrial and biological applications of pH. 4

OR

VI 1. What are buffer solutions ? Classify them. 4

2. Calculate the normality and molarity of the following solutions :
   (a) NaOH solution containing 20g in 500 ml.
   (b) 0.63 g of oxalic acid ($H_2C_2O_4$ $2H_2O$) in 250 ml. 4

3. Calculate the molecular weight of :
   (a) Cane sugar
   (b) Ferrous Ammonium Sulphate. 3

4. Briefly explain volumetric analysis. 4

UNIT—II

VII 1. What are the disadvantages of hard water ? 4

2. List the peculiar properties of carbon nanotubes. What are their applications ? 4

3. Compare the sterilization of water using bleaching powder and ozone. 3

4. How can carbon nanotubes be synthesized ? (any two methods). 4

OR

VIII 1. Give any four applications of nanotechnology. 4

2. Explain the sterilisation of water using chlorine. 4

3. Describe EDTA method of determination of hardness of water. 4

4. Classify different nanotubes. 3