TED (10) – 1003 - B

(REVISION — 2010)

Reg. No.....

Signature .....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2017

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) Distinguish between atom and molecule. 2

(b) What is nanochemistry ? Give two examples of nanomaterial. 2

PART — B

(Maximum marks : 16)

II Answer any *two* of the following questions. Each question carries 8 marks.

(a) Calculate the weight of Zinc (at.wt.65.5) required to liberate 0.05g of hydrogen from sulphuric acid. 4

(b) Illustrate Arrhenius and Lewis concept of acids and bases. 4

III (a) Calculate the pH 0.001 N HCl and 0.001 N NaOH. 4

(b) How can hardness of water be removed by ion exchange method and by boiling ? 4

IV (a) With chemical equation explain sterilization by bleaching powder and by ozone. 4

(b) Explain HiPCO and CVD methods used for the synthesis of carbon nanotubes. 4

PART — C

(Maximum marks : 30)

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

UNIT — I

V (a) Explain radicals with examples. 4

(b) Illustrate redox reactions taking the reactions in Daniel cell as an example. 4

Marks

(c) What are the following ?

(i) Standard solution (iii) End point

(ii) Titration (iv) Indicator 4

(d) Mention any two ways by which you express the concentration of a solution. 3

OR

VI (a) Balance the following skeleton equation.

$KM_nO_4 + HCl$ ..... $KCl + M_nCl_2 + H_2$ 3

(b) Calculate the equivalent weight of $Ca(OH)_2$ from the following equation.

$Ca(OH)_2 + 2HCl$ ..... $CaCl_2 + 2H_2O$. 4

(c) Explain buffer solution. 4

(d) Which indicators will you use for the following titrations.

(i) $HNO_3 \times K_2CO_3$ (iii) $H_2C_2O_4 \times NaOH$

(ii) $HNO_3 \times KOH$ (iv) $H_2C_2O_4 \times Na_2CO_3$ 4

UNIT — II

VII (a) Mention any four characteristics of potable water. 4

(b) Explain different types of hardness in water. 4

(c) Give any four applications of nanomaterials. 4

(d) Which are the different varieties of carbon nanotubes. 3

OR

VIII (a) Which are the different steps involved in the purification of water. 3

(b) Give any four properties of carbon nanotubes. 4

(c) What are carbon nanotubes ? Give two applications. 4

(d) Explain different filtration methods used for the purification of water. 4