

TED (10)–1003 B

Reg. No.

(REVISION—2010)

Signature

FIRST SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY

MARCH, 2013

APPLIED SCIENCE-I (Chemistry)

[Time : 1½ hours

(Maximum marks : 50)

PART—A

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

- | | Marks |
|--|---------|
| I (a) P ^H of a cold drink is 4.5. What will be its action on blue and red litmus solution ? | |
| (b) Rain water is the purest form of natural waters. Give reason. | (2×2=4) |

PART—B

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

- | | |
|---|----------|
| II (a) Classify the following as Lewis acids and Lewis bases. NH ₃ , Cl ⁻ , Ni ²⁺ , BF ₃ , Ag ⁺ , CN ⁻ , H ₂ O, CO ²⁺ . | 4 |
| (b) Explain the role of ion-exchange resins in softening of hard water. | 4 |
| III (a) Define equivalent weight of acids and bases. Calculate the equivalent weight of H ₂ SO ₄ and Ca (OH) ₂ . | 4 |
| (b) Explain the application of carbon nano particles in medicine. | 4 |
| IV (a) Point out the reducing and oxidizing agents in the following reaction :
$\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$ | 4 |
| (b) Enumerate the disadvantages of using hard water. | 4 |
| | (2×8=16) |

PART—C

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

UNIT—I

- | | |
|--|---|
| V (a) Define p ^H . Calculate the p ^H of 0.001 normal NaOH solution. | 4 |
| (b) Explain the neutralization reaction according to Arrhenius concept and Lewis concept with suitable example. | 4 |
| (c) Calculate the mass of zinc required to produce 20 g of H ₂ gas at STP using hydrochloric acid (At. wt. Zn = 65.5). | 4 |
| (d) Applying the following equation, calculate the equivalent mass of NH ₄ OH :
$\text{NH}_4\text{OH} + \text{HCl} \rightarrow \text{NH}_4\text{Cl} + \text{H}_2\text{O}.$ | 3 |

OR

- VI (a) What are the different types of buffer solutions? Give examples. 4
- (b) Silver nitrate solution is taken in a beaker and copper metal rod is dipped in it. The following reaction occurs :

$$\text{Cu(s)} + \text{Ag}^{2+}(\text{aq}) \rightarrow \text{Cu}^{2+}(\text{aq}) + \text{Ag(s)}$$
 What are the changes you can observe? 3
- (c) Calculate the mass of NaOH required to make 0.01 normal 250 ml solution. 4
- (d) Define standard and normal solutions. 4

UNIT—II

- VII (a) Define ionic product of water. How will you obtain its value? 4
- (b) Comment on the structure of carbon nano tubes. 4
- (c) What is sterilization of water? Mention any two sterilization methods of water. 4
- (d) Distinguish between temporary hardness and permanent hardness of water. 3

OR

- VIII (a) What are the characteristics of potable water? 4
- (b) Explain the chemical vapour deposition method for the synthesis of carbon nano tubes. 3
- (c) Write down the EDTA titration method for the estimation of hardness of water. 4
- (d) Explain the different filtration techniques used in water treatment. 4

(2×15=30)

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