

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE, OCTOBER/NOVEMBER – 2019**

**APPLIED SCIENCE – I (CHEMISTRY)**

[Maximum Marks: 50]

[Time: 1 ½ Hours]

**PART-A**

[Maximum Marks: 4]

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

- I. 1. Write the symbols of the following elements  
i) Iron            ii) Potassium
2. What is the size of nano particles? Give an example for nano particles. (2 x 2 = 4)

**PART-B**

[Maximum Marks: 16]

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

- II 1. What are the varieties of Carbon Nano tubes? Give two properties of Carbon Nano tubes? (4)  
2. What are the disadvantages of hard water? (4)
- III 1. What are weak acids and weak bases? Give one example for each. (4)  
2. Explain the electronic concept of oxidation and reduction giving one example for each. (4)
- IV 1. Draw a flow chart for the steps involved in the production of potable water. (4)  
2. Calculate the normality and molarity of a solution of H<sub>2</sub>SO<sub>4</sub> containing 9.8g in 500ml. (4)

[Molecular mass of H<sub>2</sub>SO<sub>4</sub> = 98, Equivalent mass of H<sub>2</sub>SO<sub>4</sub> = 49]

**PART-C**

[Maximum Marks: 30]

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

**UNIT -I**

- V (a) Explain Arrhenius theory of acids and bases. Give one example for each. (5)  
(b) Distinguish between atom and molecule. (5)  
(c) Define pH. Calculate the pH of 0.01M HCl solution (5)

**OR**

- VI (a) Calculate the mass of Carbon dioxide produced when 200g Calcium carbonate is heated as per the equation  $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ . (5)
- (b) Define equivalent weights of acid and base. Give its relation with molecular weight. (5)
- (c) Define ionic product of water. Calculate the concentration of  $\text{H}^+$  ions, if the concentration of  $\text{OH}^-$  is equal to 0.001M. (5)

**UNIT -II**

- VII (a) What is temporary hardness? Explain a method for its removal. (5)
- (b) Explain two methods for the synthesis of Carbon nanotube. (5)
- (c) Mention any five characteristics of potable water (5)

**OR**

- VIII (a) Explain two sterilization techniques used in the production of potable water (5)
- (b) Mention any five applications of Nanomaterials. (5)
- (c) Name any five compounds which cause hardness (5)

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