

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2020**

ENGINEERING CHEMISTRY-I

[Maximum Marks: 75]

[Time: 2.15 Hours]

PART-A

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

- I. 1. Define carbon nanotube.
2. Give the relationship between p^H and p^{OH} .
3. What are the disadvantages of using hard water in industrial purposes?
4. Define alloys. Give any one example.
5. Mention any two advantages of powder metallurgy. (3 x 2 = 6)

PART-B

(Answer *any four* of the following questions. Each question carries 6 marks)

- II 1. (a) Differentiate between atom and molecule.
(b) Calculate the number of protons and neutrons of the following elements. 4+2=6
- | | |
|-------|---------|
| 14 | 23 |
| (i) N | (ii) Na |
| 7 | 11 |
2. (a) Explain role of promoter and poison in the rate of reaction using examples.
(b) Define atomic number and mass number 4+2=6
3. (a) Explain acidic and basic buffers with one example for each.
(b) Explain the concept of conjugate acid-base pair with an example 4+2=6
4. (a) Calculate the p^H of 0.002M H_2SO_4 .
(b) Define ionic product of water and give its value at 25°C. 4+2=6
5. (a) Explain Clarke's Process for removal of temporary hardness of water.
(b) Distinguish between soft water and hard water. 4+2=6
6. (a) Give the advantages of using reverse osmosis for desalination of sea water.
(b) Give the composition of following alloys. 4+2=6
- (i) Bronze (ii) Solder

UNIT- III

- VII (a) What are the disadvantages of using hard water in domestic purposes? (5)
(b) Give treatment processes to make potable water. (5)
(c) Define sterilization of water. Give different chemical changes involved in the sterilization of water by bleaching powder. (5)

OR

- VIII (a) List any five characteristics of potable water. (5)
(b) Give reason for permanent hardness of water. Explain any one method for the removal of permanent hardness of water. (5)
(c) Explain the desalination of sea water by reverse osmosis. (5)

UNIT - IV

- IX (a) Briefly explain any five properties of metals. (5)
(b) Compare the processes Quenching and Tempering of steel. Give the advantage of Tempering over Quenching. (5)
(c) Explain Powder metallurgy for the preparation of alloys. (5)

OR

- X (a) Explain Fusion method for the preparation of alloys. (5)
(b) Define heat treatment of steel. Explain (i) Annealing (ii) Nitriding. (5)
(c) Give composition and compare any two properties of
(i) Wrought iron (ii) Steel (iii) Cast iron (5)