DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE – NOVEMBER -2020.

ENGINEERING CHEMISTRY-I

(Maximum Marks: 75)   [Time: 2.15 hours]

PART–A

Marks

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

1. What is negative catalyst? Give one example.

2. Define buffer solution.

3. How can temporary hardness be removed by Clarke's process?

4. What is the purest form of iron?

5. Give the composition of the following

   (i)Brass   (ii)Bronze   (3x2=6)

PART - B

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

1. Give any three properties and applications of CNTs.

2. Name the fundamental particles of matter. What is the charge and mass carried by each of them?

3. Define ionic product of water. Give its mathematical statement and its value for pure water at 25^0C

4. Explain the concept of conjugate acid base pair with example.

5. What is portable water and give characteristic of portable water?

6. What is sterilization? Mention the sterilization methods.

7. Write down any six properties of metals.

[4x6 =24]

PART - C

(Answer **any of the three units** from the following. Each full question carries 15 marks)
UNIT I

III   (a)   Explain catalytic promoter and poison with one example each.   (6)

(b) Define atomic number and mass number. Calculate the number of electrons, protons and neutrons of the following.

(i) $_7N^{14}$ (ii) $_{17}Cl^{35}$ (5)

(c) Name and explain any two methods for the synthesis of carbon nano tubes. (4)

OR

IV (a) Define homogeneous catalysis and heterogeneous catalysis with one example each. (6)

(b) Give any five applications of nano materials. (5)

(c) Give differences between atom and molecules. (4)

UNIT- II

V (a) Define pH and pOH scale. Give relation between them. (5)

(b) Give any five applications of pH. (5)

(c) Calculate the pH of the following.

(i)0.01M HCI   (ii)0.01M NaOH   (5)

OR

VI (a) Define Normality and Molarity and give their mathematical formulae. (6)

(b) What is the principle of volumetric analysis? (4)

(c) A 0.1 M solution of an acid contains 2.25g in 250 mL of its solution. What is the molar mass of the acid? (5)

UNIT- III

VII (a) What is soft water and hard water? (4)

(b) Explain ion exchange process. (6)

(c) Explain reverse osmosis. (5)

OR

VIII (a) Give any fie physical properties of water. (5)

(b) What are the different types of harness of water? (4)

(c) Explain two methods for the removal of temporary hardness. (6)

UNIT – IV

IX (a) Explain the following

                (i) Quenching (ii) Tempering (iii) Nitriding   (6)

    (b) Define alloy. Give any four purposes of making alloys.   (5)

    (c) Give any two advantages and limitations of powder metallurgy.   (4)

OR

X (a) Give the effects of any two impurities in steel.   (4)

    (b) Mention five different steps in powder metallurgy.   (5)

    (c) Give any six uses of powder metallurgy.   (6)

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