

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE, APRIL-2022**

**ENGINEERING CHEMISTRY - II**

[Maximum marks: 100]

(Time: 3 Hours)

**PART – A**

**Maximum marks : 10**

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

1. Noble gases are also known as inert gases. Why?
2. What are non-electrolytes? Give two examples.
3. List any four properties of refractories.
4. Define calorific value.
5. What are secondary pollutants? Give two examples. (5 x 2 = 10)

**PART – B**

**Maximum marks : 30**

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

1. (a) Give de Broglie's equation. Explain the terms. de Broglie's relation is significant only to microscopic particles. Explain.  
(b) Explain hydrogen bonding with one example. (4 + 2 = 6)
2. (a) Write all the possible quantum number values of valence electron of Aluminium. (Z = 13)  
(b) Give any two limitations of Bohr's atom model. (4 + 2 = 6)
3. (a) Explain the electrolysis of aqueous sodium chloride.  
(b) What is the effect of temperature on the conduction of metallic and electrolytic conductors. (4 + 2 = 6)
4. (a) Define Faraday's first law of electrolysis. Give its mathematical expression.  
(b) Coating of zinc is preferred than tin for the protection of iron from corrosion. Why? (4 + 2 = 6)

5. (a) Write any two methods used for distinguishing saturated and unsaturated organic compounds.
- (b) List any two advantages of optical fibre. (4 + 2 = 6)
6. (a) Distinguish between homo polymers and co polymers. Write one example each.
- (b) Write two examples each for natural fibre and synthetic rubber. (4 + 2 = 6)
7. (a) What is water gas? How it is prepared?
- (b) Define London smog. (4 + 2 = 6)

### PART – C

**Maximum marks : 60**

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

#### UNIT –I

- III. (a) Explain ionic and covalent bonding. Illustrate the formation of  $\text{CaF}_2$   
(Ca = 40, F = 9) and  $\text{HCl}$  (H = 1, Cl = 17) (6)
- (b) Distinguish between orbit and orbital. (5)
- (c) Calculate the uncertainty in position of an electron moving with a velocity of  $4.2 \times 10^5$  m/s. (mass of electron =  $9.1 \times 10^{-31}$  kg,  $h = 6.625 \times 10^{-34}$  kgm<sup>2</sup>/s. (4)

OR

- IV.(a) Explain the main postulates of Bohr's atom model. (6)
- (b) State and illustrate Hund's rule of maximum multiplicity and Pauli's exclusion principle. (5)
- (c) Write a short note on principal quantum number. (4)

#### UNIT-II

- V. (a) Explain the working of  $\text{H}_2\text{-O}_2$  fuel cell. Write any two advantages. (6)
- (b) Describe the mechanism of rusting of iron. (5)
- (c) What is electrochemical series? What will you observe when iron rod is dipped in copper sulphate solution? (4)

OR

- VI. (a) With a sketch, explain the working of Daniel cell. (6)
- (b) Compare barrier protection and cathodic protection methods for the prevention of corrosion. (5)
- (c) Distinguish between electroplating and anodising. (4)

### UNIT-III

- VII. (a) How polymers are classified based on mode of synthesis. Explain with one example each. (6)
- (b) Write a note on soda glass and borosilicate glass. (5)
- (c) Define catenation and tetra covalency. (4)

### OR

- VIII.(a) Explain the method used for making natural rubber hard. What are its advantages? (6)
- (b) Distinguish between thermoplastics and thermosetting plastics. (5)
- (c) What is a functional group? Which are the functional groups in amine and aldehyde. (4)

### UNIT-IV

- IX. (a) Define cracking. What are its types? Explain. (6)
- (b) Explain greenhouse effect? Give its major consequences. (5)
- (c) What are the qualities of a good fuel? (4)

### OR

- X. (a) How fuels are classified based on their physical state. Compare any four properties. (6)
- (b) Mention the importance of green chemistry in day-to-day life. (5)
- (c) What is air pollution? What are its major sources? (4)

\*\*\*\*\*