

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, NOVEMBER - 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. What is Pauli's exclusion principle?
2. Define corrosion.
3. What is Galvanic cell? Give an example.
4. What are functional groups?
5. Define calorific value. (5 x 2 = 10)

PART – B

Maximum marks : 30

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

1. (a) Differentiate between orbit and orbital. (4)
(b) Name all four quantum numbers. (2)
2. (a) Draw a labelled figure for electroplating of nickel over steel spoon and give the electrode reactions. (4)
(b) Write any two conditions necessary for corrosion. (2)
3. (a) Give the functional groups present in (i) Amines (ii) Ester (iii) Acids (iv) Aldehydes. (4)
(b) What is vulcanization. (2)
4. (a) What are the different regions of atmosphere? Briefly explain. (4)
(b) What are nuclear fuels? Give two examples. (2)
5. (a) Explain any two merits and demerits of Bohr's model of atom. (4)
(b) Draw the shape of p orbitals. (2)
6. (a) Distinguish between anodizing and electroplating. (4)

- (b) What is cathodic protection? (2)
7. (a) Mention the monomers and any one use of the following polymers.
(i) Bakelite (ii) Nylon-6 (4)
- (b) What is borosilicate glass? (2)

PART – C

Maximum marks : 60

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

UNIT –I

- III. (a) State Hund's rule of maximum multiplicity. Illustrate it taking nitrogen and neon as examples. (6)
- (b) Write all quantum numbers of the electron present in outermost shell of potassium. (At.No.=19) (5)
- (c) Mention the postulates of Bohr's atom theory. (4)

OR

- IV. (a) Illustrate the formation of coordinate bonding and hydrogen bonding with an example. (6)
- (b) State Heisenberg's uncertainty principle. Give its mathematical expression and explain the terms. (5)
- (c) How is ionic bond formed? Give two examples. (4)

UNIT-II

- V. (a) Explain H_2-O_2 fuel cell. What are the cell reactions involved in it? (6)
- (b) Define electrolysis. Mention the applications of electrolysis. (5)
- (c) What are the factors affecting rusting? (4)

OR

- VI. (a) What are the difference between metallic and electrolytic conductors. Give two examples for each. (6)
- (b) What is electrochemical series? Mention any three of its application. (5)
- (c) Briefly explain electrochemical theory of rusting. (4)

UNIT-III

- VII. (a) What are refractories? Classify the refractories on the basis of chemical nature with one example for each. (6)
- (b) Explain addition polymerisation and condensation polymerisation. (5)
- (c) What are the difference between organic and inorganic compounds? (4)

OR

- VIII.(a) How are polymers classified based on their intermolecular forces. Explain with an example for each. (6)
- (b) Explain the uniqueness of carbon atom. (5)
- (c) Write any four advantages of optical fibers. (4)

UNIT-IV

- IX. (a) What is cracking? Distinguish between thermal cracking and catalytic cracking. (6)
- (b) What is green house effect and give any three consequences. (5)
- (c) What are the basic principles of green chemistry. (4)

OR

- X. (a) What are the fuels? How are they classified based upon their physical state? Explain with two examples for each. (6)
- (b) What is water pollution? What are the major water pollutants? (5)
- (c) Distinguish between classical smog and photochemical smog. (4)
