

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

ENGINEERING CHEMISTRY – II

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

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

1. Define an orbit.
2. What is a primary cell ? Give one example.
3. Write two examples of synthetic rubber.
4. What is a salt bridge ?
5. What is smog ?

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. (a) Write the correct set of quantum numbers for the valence electron in sodium atom ($Z = 11$)
(b) What are super conductors ? (4+2 = 6)
2. (a) State Faraday's laws of electrolysis.
(b) What is rust ? Give its chemical formula. (4+2 = 6)
3. (a) Distinguish between homopolymers and copolymers. Give examples.
(b) Explain tetravalency of Carbon. (4+2 = 6)
4. (a) Write notes on thermal cracking and catalytic cracking.
(b) Write two harmful effects of ozone depletion. (4+2 = 6)
5. (a) What is a dative bond ? Give two examples.
(b) What is the reason for the stability of noble gases ? (4+2 = 6)
6. (a) What are the functions of a salt bridge in an electrochemical cell ?
(b) What is meant by a functional group ? Write the functional group in aldehyde and amine. (4+2 = 6)
7. (a) Describe the classification of polymers on the basis of magnitude of intermolecular forces.
(b) Write the monomers of the following polymers :
(i) Neoprene (ii) Teflon (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) State Heisenberg's uncertainty principle. Calculate the uncertainty in the position of an electron if the uncertainty in its velocity is $5.7 \times 10^5 \text{ ms}^{-1}$ ($h = 6.625 \times 10^{-34} \text{ kgm}^2\text{s}^{-1}$, mass of electron = $9.1 \times 10^{-31} \text{ kg}$.) 5
- (b) What is the limitation of de Broglie relationship ? Calculate the velocity of a moving electron which has a wavelength of 12 pm. 5
- (c) List any five differences between orbit and orbital. 5

OR

- IV (a) Explain the formation of an ionic bond. Give any two examples. 5
- (b) What is Hydrogen bonding ? Write two conditions necessary for the formation of Hydrogen bonding. Explain why boiling point of HCl is lower than that of HF. 5
- (c) Mention five differences between ionic compounds and covalent compounds. 5

UNIT — II

- V (a) Classify the different types of conductors. 5
- (b) Explain the construction and working of Daniel cell. 5
- (c) Distinguish between electroplating and anodizing. 5

OR

- VI (a) What is electrochemical series and what are its applications ? 5
- (b) Explain the construction and working of $\text{H}_2\text{-O}_2$ fuel cell. 5
- (c) Explain two methods used to prevent rusting of iron. 5

UNIT — III

- VII (a) Distinguish between thermoplastics and thermosetting plastics. 5
- (b) Write notes on : (i) Soda glass (ii) Safety glass. 5
- (c) Write five characteristics of refractories. 5

OR

- VIII (a) Explain the classification of polymers based on mode of polymerization and distinguish between them. 5
- (b) What are optical fibres ? Write three uses of optical fibres. 5
- (c) What is borosilicate glass ? List its important properties and two uses. 5

UNIT — IV

- IX (a) What are primary fuels and secondary fuels ? Give three examples for each. 5
- (b) Mention three steps to prevent water pollution and write two examples of water pollutants. 5
- (c) Name three liquid fuels derived from petroleum. Write their calorific values and uses. 5

OR

- X (a) What are nuclear fuels ? Write three examples of nuclear fuels. 5
- (b) What is photochemical smog ? Mention its harmful effects. 5
- (c) Explain the progressive transformation of wood to anthracite coal. 5