

TED (15) – 2004

Reg. No. ....

(REVISION — 2015)

Signature .....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 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. Bohr's orbits are also known as stationary states. Why ?
2. Write two examples each for weak electrolytes and non-electrolytes.
3. List any two advantages of optical fibres.
4. How can we reduce the rate of global warming of atmosphere ?
5. Define the terms Pollution and Pollutant.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

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

1. (a) Explain the concept of quantum numbers needed to specify an electron in an atom.  
(b) Sodium chloride is a bad conductor in the solid state. Why ? (4 + 2 = 6)
2. (a) What are the factors which favour rusting of iron ?  
(b) What is a secondary cell ? Give two examples. (4 + 2 = 6)
3. (a) Bakelite & PVC are two commonly used polymers. Write the monomers of the polymers and any two uses of the polymers.  
(b) What is catenation ? Give two elements which show maximum catenation. (4 + 2 = 6)
4. (a) What is cracking ? Write two advantages of catalytic cracking.  
(b) Write two harmful effects of acid rain. (4 + 2 = 6)
5. (a) What are multiple covalent bonds ? Give two examples.  
(b) Which orbital is non - directional ? (4 + 2 = 6)

6. (a) Define the following terms :
- (i) Functional group (ii) Isomerism
- (b) List two techniques used in green chemistry to minimize pollution. (4 + 2 = 6)
7. (a) What are fuel cells ? Write two advantages of fuel cells.
- (b) Can we store Copper Sulphate solution in a Zinc vessel. Give suitable explanation. (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) Write the de Broglie relation for a material particle. Calculate the de Broglie wavelength for an electron moving with a velocity of  $10^3 \text{ms}^{-1}$ .  
( $h = 6.625 \times 10^{-34} \text{kgm}^2\text{s}^{-1}$ ,  $m = 9.1 \times 10^{-31} \text{kg}$ ) 5
- (b) State Hund's rule of maximum multiplicity. Illustrate it using two examples. 5
- (c) List three merits and two demerits of Bohr model of atom. 5

OR

- IV (a) State Aufbau principle. Write the electronic configuration of Na (Z - 11) and K (Z - 19). 5
- (b) Define an orbital. Draw the shape of s,  $p_x$ ,  $p_y$ , and  $p_z$  orbital. 5
- (c) What are the main postulates of Bohr's theory of atoms ? 5

## UNIT — II

- V (a) Distinguish between electronic and electrolytic conduction. 5
- (b) A galvanic cell reaction is given below.
- $$\text{Zn}_{(s)} + \text{Ni}^{2+}_{(aq)} \rightarrow \text{Zn}^{2+}_{(aq)} + \text{Ni}_{(s)}$$
- Write the cell notation, reactions at the electrodes and compute e. m. f.  
(Given  $E^0 \text{Ni}^{2+}/\text{Ni} = -0.25\text{V}$ ,  $E^0 \text{Zn}^{2+}/\text{Zn} = -0.76\text{V}$ ) 5
- (c) What is corrosion ? How are underground iron pipes protected from corrosion ? 5

OR

- VI (a) Write any five applications of electrolysis. 5
- (b) Distinguish between electrolytic cell and galvanic cell. 5
- (c) Explain electrochemical theory of corrosion. 5

