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)

Marks

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 $10^3 ms^{-1}$.

($h = 6.625 \times 10^{-34} kgm^2s^{-1}$, $m = 9.1 \times 10^{-31} kg$) 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.

$Zn_{(s)} + Ni^{2+}{}_{(aq)} \rightarrow Zn^{2+}{}_{(aq)} + Ni_{(s)}$

Write the cell notation, reactions at the electrodes and compute e. m. f.

(Given $E^0\ Ni^{2+}/Ni = -0.25V$, $E^0\ Zn^{2+}/Zn = -0.76V$) 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

Marks

Unit — III

VII (a) Distinguish between organic and inorganic compounds. 5

(b) What are refractories ? How are they classified ? Give one example for each. 5

(c) State the significance of the numbers in the polymer names - Nylon 6:6 and Nylon 6. Write the monomers of Nylon 6:6 and Nylon 6. 5

Or

VIII (a) Distinguish between saturated and unsaturated compounds with one example for each. 5

(b) Write the monomer present in natural rubber. How will you make natural rubber hard ? Write two advantages of this process. 5

(c) Describe the uniqueness of Carbon atom. 5

Unit — IV

IX (a) What are the qualities of a good fuel ? 5

(b) Explain the following :

(i) Green House Effect (ii) Acid Rain 5

(c) What is green chemistry ? Mention three principles of green chemistry. 5

Or

X (a) Define calorific value of a fuel. What do you mean by gross and net calorific values ? 5

(b) Write the constituents of Natural gas and Gobar gas and mention any two uses of Natural gas. 5

(c) How are fuels classified based on the physical state ? Compare them. 5