TED (15) – 2004

(REVISION — 2015)

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# SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/ TECHNOLOGY — MARCH, 2016

## ENGINEERING CHEMISTRY - II

(Common to all branches except DCP and CABM)

[*Time* : 3 hours

(Maximum marks : 100)

## PART — A

(Maximum marks : 10)

I Answer the following questions in one or two sentences. Each question carries 2 marks. Marks

1. $H_2O$ is a liquid while $H_2S$ is a gas. Give reason.
2. Give two examples each for electrolytes and non-electrolytes.
3. What is activity series ?
4. What are refractories ? Mention two uses.
5. Name the different regions of the atmosphere ?

(5×2=10)

## PART — B

(Maximum marks : 30)

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

1. (a) State any four postulates of Bohr's atom model. 4

   (b) Give the significance of principle quantum number. 2

2. (a) Draw a labelled figure for electroplating of nickel over steel spoon and give the electrode reactions. 4

   (b) Arrange the following metals in the decreasing order of their reactivity. Al, Cu, Fe, Mg, Zn and K. 2

3. (a) What are saturated and unsaturated organic compounds ? Give an example for each and give one test to identify them. 4

   (b) What is the role of sulphur in vulcanization of rubber ? 2

4. (a) Ordinary rain water is slightly acidic. When does it become acid rain and what are its threats ? 4

   (b) How will you convert higher hydrocarbons into petrol. 2

Marks

5 (a) What is the maximum number of electrons that can be accommodated in an orbital ? Name and state the rule which governs this. 4

(b) The azimuthal quantum number of an orbital is 1. Name the orbital and what is its shape ? 2

6 (a) How is underground iron pipes protected from corrosion ? Name the method and give the principle behind it ? 4

(b) List any two applications of fuel cell. 2

7 (a) Mention the monomers and any one use of the following polymers.

(i) Nylon 6 (ii) Buna-N 4

(b) Name the raw materials used in the manufacture of ordinary glass and give one application. 2

## PART— C

(Maximum marks : 60)

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

### UNIT—I

III (a) Illustrate the formation of ionic bond and covalent bond with an example.

(b) Write all quantum numbers of the electron present in outermost shell of potassium. 6

(At. No. = 19)

(c) State Heisenberg's uncertainty principle. Give its mathematical expression and explain the terms. 5

4

OR

IV (a) State Hund's rule of maximum multiplicity. Illustrate it taking nitrogen and neon as examples.

(b) What do you mean by dual nature of matter ? An electron is associated with a wavelength of 10nm. Calculate the velocity of the electron. ($h = 6.63 \times 10^{-34}$ JS, Mass of electron = $9.1 \times 10^{-31}$ kg) 6

(c) Bring out the differences between an orbit and an orbital. 5

4

### UNIT—II

V (a) What is electrolysis and state Faraday's laws of electrolysis.

(b) What is rust and give its chemical formula ? Write the conditions for rusting. 6

(c) How will you represent Daniel cell ? Write the electrode reactions and net cell reaction. 5

4

OR

Marks

VI (a) A cell is constructed using Zn and Ag electrodes. Write

(i) the electrode reactions

(ii) the net cell reaction

(iii) cell representation

(iv) compute the e.m.f. of the cell, given $E^0Zn^{2+}/Zn = -0.76$ and $E^0 Ag^+/Ag = 0.80V$. 6

(b) Give one example each for metallic and electrolytic conductors. What are the major differences between the two ? 5

(c) Write the principle behind barrier protection and suggest any two methods for it. 4

UNIT—III

VII (a) How are plastics classified based on their method of molding and applications and differentiate between them with one examples each. 6

(b) Classify the following polymers into addition and condensation polymers.

(i) Teflon (iv) Neoprene

(ii) Bakelite (v) Nylon 6,6

(iii) Buna-S 5

(c) Compare organic and inorganic compounds. 4

OR

VIII (a) How are polymers classified based on their structure ? Give one example for each. 6

(b) What are functional groups ? Give the functional groups present in aldehydes, aminess and esters ? 5

(c) Write any four advantages of optical fibres. 4

UNIT—IV

IX (a) What are fules ? How are they classified based upon their physical state. Give two examples for each category. 6

(b) What is greenhouse effect and give any three consequences. 5

(c) Comment on the relevance of green chemistry in the present scenario. 4

OR

X (a) What is smog ? Explain different types of smog. 6

(b) Write the composition and preparation of water gas and producer gas. 5

(c) What is soil pollution ? Give any three remedial measures. 4