TED (15) – 2004

(REVISION — 2015)

Reg. No.....

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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 = 9.1×10^{-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. 6

(b) What is rust and give its chemical formula ? Write the conditions for rusting. 5

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