Printed Pages : 7 EAS102

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 9603 Roll No.

B.Tech

(SEM I) ODD SEMESTER THEORY EXAMINATION 2009-10

ENGG.CHEMISTRY -I

Time : 3 Hours] *[Total Marks : 100*

SECTION-A

1 Choose/Fill correct answer : 20×1=20

(i) Which of the following has a bond order of 2.5?

(a) CO

(b) NO

(c) He^{2+}

(d) O_2^-

(ii) Hydrogen bonding is maximum in

(a) Ethyl chloride

(b) Ethanol

(c) Diethyl ether

(d) Triethyl amine

(iii) A zero order reaction is one

(a) in which rate is independent of reactants concentration.

(b) in which one of the reactants is in large excess.

(c) whose rate is not affected by time

(d) whose rate increases with time.

(iv) Rusting of iron is

(a) Enhanced by dry air.

(b) Prevented by cleaning

(c) Retarted in the presence of dissolved salts.

(d) Prevented if the article is connected with a piece of Mg.

(v) The most stable carbanion is

(a) methyl carbanion

(b) primary carbanion

(c) secondary carbanion

(d) tertiary carbanion.

(vi) Chiral molecules are those which are

(a) not superimpossible on their mirror image

(b) are superimpossible on their mirror image

(c) show geometrical isomerism

(d) unstable molecules.

(vii) Bakelite is

(a) gel

(b) solid

(c) liquid

(d) gas

(viii) The vulcanized rubber contains

(a) sulphur

(b) iron

(c) berrylium

(d) zinc

(ix) Presence of functional group in a compound can be established by using

(a) Chromatography

(b) Mass spectroscopy

(c) IR spectroscopy

(d) X-rays diffraction.

(x) Which indicator have pH range of 8.3-10

(a) Phenolphthalein

(b) methyl red

(c) methyl orange

(d) none of these

(xi) Fill in the blanks :

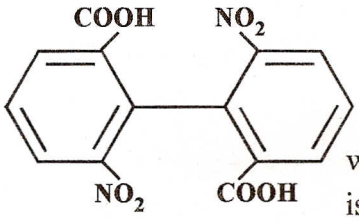
(i) Hydrogen bond is a _____ than a covalent bond.

(ii) Graphite is an _____ of carbon.

(iii) An atom at the corner of a cubic unit cell makes _____ contribution to particular unit cell.

(iv) The degree of freedom of a triple point is _____.

(v) _____ is electrochemical disintegration of a metal.

(vi) 

will show _____ isomerism.

(vii) In cannizzaro reaction aldehyde must consist of _____.

(viii) The monomer of natural rubber is _____.

(ix) The main component of biogas is _____.

(x) Hardness of water is expressed in terms of equivalent of _____.

SECTION-B

2 Attempt any **three** of the following : **10×3=30**

(i) (a) What is metallic bond? Explain it on the basis of bond theory.

(b) A unit cell of sodium chloride has four formula units. The edge length of unit cell is 0.564. What is the density of sodium chloride?

(ii) State and explain phase rule. Discuss the salient features of phase diagram of water system.

(iii) (a) Describe the conformational isomers of n-butane.

(b) Write the mechanism of the following reactions :

(i) Aldol condensation

(ii) Beckmann rearrangement

(iv) (a) Describe preparation, properties and application of

(i) Buna-S

(ii) Nylon 6,6.

(b) Discuss general methods for the preparation of organometallic compounds. What are applications of organometallic compound of Mg.

(v) (a) What is importance of IR spectroscopy in finger print region?

(b) 0.72 gm of a fuel containing 80% carbon, when burnt in a bomb calorimeter, increased the temperature of water from 27.3°C to 29.1°C. If the calorimeter contains 250 grams of water and its water equivalent is 150 gram calculate the HCV of fuel. Give answer in kJ/kg.

SECTION-C

10×5=50

3 Attempt any **one** part of the following :

(a) Discuss the classification of liquid crystals and write down its applications.

(b) Describe the preparation, structure and applications of fullerenes.

4 Attempt any **one** part of the following :

(a) Describe the construction of galvanic cell. Write down the electrode reactions and formula of its e.m.f.

(b) In a second order reaction, where the initial concentration of the reactants is the same, half of the reactants are consumed in 60 minutes. If the specific reaction rate is 5.2×10^{-3} mol^{-1} L $minute^{-1}$. What is the initial concentration of the reactant.

5 Attempt any **one** part of the following :

(a) What are carbocations? Show hybridization in carbocations and discuss stability of primary, secondary and tertiary carbocations.

(b) Discuss stereochemistry of tartaric acid. What will happen if one of the OH groups of tartaric acid is replaced by NH_2 group ?

6 Attempt any **one** part of the following :

(a) Write short note on conducting polymers.

(b) What are differences between

(i) Thermosetting and thermoplastic polymers

(ii) Homopolymers and copolymers.

7 Attempt any **one** part of the following:

(a) Describe proximate and ultimate analysis of fuels.

(b) What is hardness of water? Describe zeolite process for making soft water from hard water.
