2023

CHEMISTRY-I

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer 1 is Compulsory and any four from 2 to 7.

1x20=20

(1) (a) Which of the following is a non-electrolyte:

i) NaCl

ii) HNO_3

iii) CH_3COOH

iv) $C_6H_{12}O_6$

(b) Which of the following is a primary pollutant?

i) Particulates

ii) Sulphurous smog

iii) PAN

iv) None of the above

(c) Dissociation of ionic compounds by passing electricity is known as

i) Redox reaction

ii) Electrochemical reaction

iii) Electrolytic reaction

iv) Electro-dynamic reaction.

(d) Which of the following metal is responsible for the tragedy of Minamata (Japan)?

i) Cd

ii) Hg

iii) As

iv) Pb

(e) Reaeration of water body means:

i) Oxygen of the air mixed with water and gets dissolved into it.

ii) Consumption of dissolved oxygen of water by biodegradable organic pollutant.

iii) Consumption of dissolved oxygen of water by aquatic plants and animals through respiration.

iv) Mixing of oxygen in water through photosynthesis of green aquatic plants and algae.

(f) Saturated hydrocarbons are also called

i) Paraffins

ii) Alkenes

iii) Alkynes

iv) Alcohols

g) "CHO" group indicates the

i) Aldehyde

ii) Ketone

iii) Carboxylic acid

iv) Ether

h) For optically active organic compounds,

i) The carbon must be chiral/asymmetric

ii) The carbon must be symmetric

iii) The carbon must be alkene

iv) The carbon must be alkyne

i) Pyrolysis is happened in the absence

i) Oxygen/Air

ii) Nirogen

iii) Helium

iv) Argon

j) Propanol-1 and Propanol-2 is the example of

i) Positional isomer

ii) Functional isomer

iii) Chain isomer

iv) Chiral compound

k) Charge on a neutron is

i) Unipositive

ii) Uninegative

iii) Zero

iv) None of above

l) Atomic mass of chlorine is

i) 33

ii) 34

iii) 35

iv) 36

m) Example of solid lubricant

i) Graphite

ii) Grease

iii) CNG

iv) Mineral oil

n) Stoichiometric burning of propane gives ____ water molecules.

i) 2

ii) 3

iii) 4

iv) 5

o) Which of the followings is a renewable source of energy?

i) Bioethanol

ii) Coal

iii) Petroleum

iv) Natural gas

p) Which one of the following is an example of addition polymer?

i) Buna-S-Rubber

ii) PP

iii) Bakelite

iv) Polyester

q) In homomers

i) All building blocks are identical

ii) All building blocks are not identical

iii) Both i) & ii) are correct

iv) None

r) ---------- is the monomer of Natural Rubber.

i) Chloro-isoprene

ii) Isoprene

iii) Styrene

iv) 1,3- Butadiene

s) Froth flotation method is use for concentration of

i) Sulphide ores

ii) Carbonate ores

iii) Fluoride ore

iv) None

t) Carbonate ores are concentrated by

i) Calcination

ii) Roasting

iii) Amalgamation

iv) None

2 (a) What are the differences between strong electrolyte and week electrolyte? Explain with example. 2+1

(b) Discuss Faraday's 2nd law of electrolysis with equation. 4

(c) What are the industrial applications of electrolytic reactions? 2

(d) Differentiate between primary and secondary pollutants with examples. 3

(e) Write short note on acid rain 3

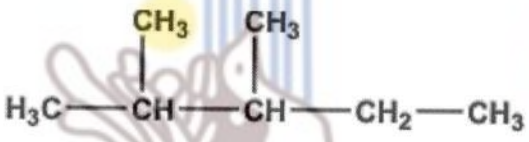
(f) What amount of silver will be deposited when electric current of 3.3 ampere is passed through a silver nitrate solution for 20 minutes. (At. Mass of Ag = 108 a.m.u) 3

(g) Point out the differences between B.O.D. and C.O.D. 2

3 (a) Write the prefix and draw the structure if carbon contains 1x4=4

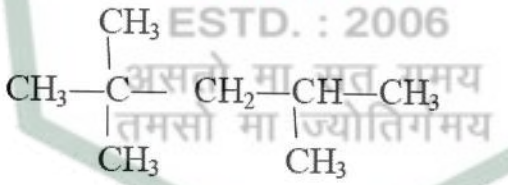
(i) 1
(ii) 2
(iii) 3
(iv) 4

(b) Draw the IUPAC names of the following compounds 4x1/2=2

(i) 

(ii) CH_3-CH_2-CH=CH_2

(iii) $CHCl_3$

(iv) 

(c) Draw the structures of the following compounds 4x1/2=2

(i) 2,4-Dimethyl heptane

(ii) Lactic acid

(iii) Cis-but-2-ene

(iv) Propyne-1

(d) An organic compound with molecular formula C_6H_{14}, write down the possible structures/isomers and their IUPAC names. 5

	(e)	Give a laboratory preparation method for alkane with equation.	3
	(f)	Write short notes of Portland Cement.	4
4	(a)	Explain the terms - isotopes, isobars and isotones with examples.	2x3=6
	(b)	What is an orbital? Write briefly about the shapes of s and p orbitals.	1+4=5
	(c)	State three important qualities of an ideal lubricant.	3
	(d)	Write short notes on (any three) (i) Biofuels (ii) Fossil fuel (iii) Nuclear fuel (iv) LPG	3 X 2=6
5	(a)	What is a co-polymer? Distinguish between co-polymer and homo-polymer.	1+2=3
	(b)	Name two monomers of Nylon 6,6. Write the reaction for the synthesis of Nylon 6,6.	2+3=5
	(c)	Write the polymerization reaction of Bakelite. Give two uses of Bakelite.	3+2=5
	(d)	What is an amalgam of metal? Give the reactions for extraction of Ag by amalgamation method.	1+4=5
	(e)	Define mineral and ore.	1+1=2
6	(a)	Write short note on: (i) Catalytic converter and (ii) Electrostatic Precipitator	2+2=4
	(b)	Give one example of each strong and week electrolyte.	1
	(c)	Write down the reaction and their product when Grignard reagent is hydrolyzed. Or Write short note on Hydraulic cement	2
	(d)	When alkene is treated with ozone and hydrolysis with Zn, it gives two molecules of carbonyl compounds, write down the reaction and their products	3
	(e)	Write down the electronic configuration of iron (atomic number=26).	2
	(f)	Write short notes on (any one) (i) Classification of coal (ii) Carbonization of coal	3
	(g)	Explain froth flotation method for concentration of sulfide ores. Give schematic diagram.	5

7 (a) Describe purification of Aluminium by Hoopes Method. 3

Or

Differentiate between primary and secondary pollutants with examples.

(b) What are the industrial applications of electrolytic reactions? 2

Or

State the Faraday's 2nd law of electrolysis with equation.

(c) Give the reaction for preparation of Natural Rubber. What is SBR? 3+2=5

Or

What is an alloy? What are two different types of alloy? Give example of each. 1+2+2=5

(d) What is an orbital? Write briefly about the shapes of s and p orbitals. 1+4=5

Or

State three important qualities of an ideal lubricant. Explain ionization energy with equation. 3+2=5

(e) Give a preparation method in laboratory for alkynes. 3

Or

Write down the Markovnikoff and Anti- Markovnikoff reactions with their products.

(f) What is Bayer's reagents? Write down the hydroxylation reaction. 1+1=2

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