Total number of printed pages:4

D/1st/DCH101

2021

CHEMISTRY-I

Full Marks: 100

Time: Three hours

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

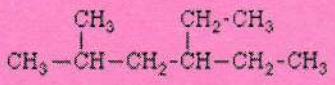
*Answer **any five** questions.*

1.	a)	Who discovered proton and neutron? What is meant by atomic number?	1+1+1 = 3
	b)	What is an orbital? Give the shapes of s and p orbitals.	2+2 = 4
	c)	Explain the use of Aufbau principle, Pauli's exclusion principle and Hund's rule in writing the electronic configuration of nitrogen.	3
	d)	State the modern periodic law. Mention briefly about the periods and groups present in the modern periodic law.	2+3 = 5
	e)	Define the term lubricant and give two example. Mention two functions of lubricants.	2+1+2 = 5
2.	a)	What are the general formula of alkane, alkene and alkyne compounds? Give example each.	6 x ½ = 3
	b)	What would be the root name or word or parent name if carbon number having: (i) 1, (ii) 2, (iii) 3, (iv) 4, (v) 5, (vi) 6.	6 x ½ = 3
	c)	Draw the structure of first compounds of alkane and alkene, give their names.	4 x1/2=2
	d)	What is the full form of IUPAC?	1
	e)	Draw the structures of the following compounds: (i) 2-Methylbutane (ii) 2,3,6-Trimethylheptane (iii) Butene-1 (iv) 2,2-Dimethylpropane (v) t-Butyl	6 x ½ = 3

alcohol (vi) Primary alcohol (ethanol)

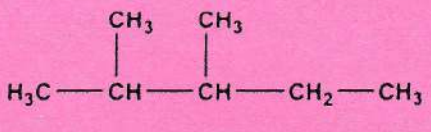
f) Give the IUPAC names of the following compounds: 6 x ½ = 3

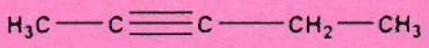
(i) 

(ii) 

(iii) $CH_3CH{=}CH_2$

(iv) $CH_3C{\equiv}CH$

(v) 

(vi) 

g) Give a laboratory method with reactions for preparation of alkane or alkene. 3

h) How will you convert 1-propene to 1-propyne? 2

3. a) How is ethanol manufactured from starch? 3

b) Mention two important properties of an ideal fuel. Give an example of nuclear fuel. 2+1 = 3

c) What is combustion of fuels? Differentiate between gross and net calorific vales of fuels. 2+2 = 4

d) Differentiate between primary pollutant and secondary pollutant with example. 2

e) What are the sources and biochemical effects of carbon monoxide (CO) 3

Or

Write down the differences between BOD and COD

f) Write short notes on (any two): 2.5 x 2 =5
(i) Scrubber (ii) Electrostatic Precipitator (iii) catalytic converter

4. a) What are strong and weak electrolytes? Give examples. 4

b) What are the differences between electrolytic cell and electrochemical cell?. 2

c) Explain Faradays first law of electrolysis with proper mathematical equation. Define electrochemical equivalent? 4

d) How many hours does it take to reduce 3 mole of Fe^{3+} to Fe^{2+} with 2 amp current? 4

e) When 3 amperes of electric current is passed for 20 minutes through a $AgNO_3$ solution, 4g of silver is deposited. Calculate the electrochemical equivalent of silver (Ag) 3

f) Discuss purification of Aluminum by Hoop's method. 3

5. a) Distinguish between homo-polymer and co-polymer. 4

Give two suitable examples of each type of polymer.

b) What is addition polymerization reaction? Name the monomer units of the following polymers: 6

(i) PVC (ii) PP (iii) Perpex (iv) PS

c) Write short notes on: 6

(i) Nylon 6,6 (ii) Buna-S-rubber (iii) Natural rubber

d) Define mineral, ore, flux and slag. 4

6. a) Distinguish between Calcination and Roasting. 3

b) Name two important ores of aluminum. Explain role of Baeyer's process in metallurgical operation of aluminum 2+3

c) What do mean by Self-reduction process? 2

d) How will you prepare primary or secondary alcohol? 3

e) How will you differentiate between metal and non-metal. 3

f) Write short notes on: (i) Ionisation Energy (ii) Electron Affinity 2 x2 =4