

Roll No.

Total No. of Questions : 4]

[Total No. of Printed Pages : 11

11thARF(S/Z)JD-2026

1524-B

CHEMISTRY

Time : 3 Hours]

[Maximum Marks : 70

Note:- “Attempt any 60 Marks out of 70 Marks”.

SECTION-A

1. Select the correct one: (1 mark each)

(i) A pure substance which contains only one type of atoms
is called

(a) An element

(b) A Compound

(c) A Solid

(d) A liquid

(ii) The number of molecules in 89.6 litre of a gas at NTP are:

- (a) 6.023×10^{23}
- (b) $2 \times 6.023 \times 10^{23}$
- (c) $3 \times 6.023 \times 10^{23}$
- (d) $4 \times 6.023 \times 10^{23}$

(iii) The discovery of neutron came very late because

- (a) It is present in nucleus
- (b) It is a fundamental particle
- (c) It does not move
- (d) It does not carry any charge

(iv) Which is most acidic oxide

- | | |
|-----------------------------|-----------------------------|
| (a) Cl_2O | (b) Cl_2O_3 |
| (c) Cl_2O_5 | (d) Cl_2O_7 |

- (v) Which one of the following is an extensive property
- (a) Enthalpy (b) Concentration
- (c) Density (d) Viscosity
- (vi) In which of the following change entropy decreases?
- (a) Crystallisation of sucrose from solution
- (b) Dissolving sucrose in water
- (c) Melting of ice
- (d) Vaporisation of camphor
- (vii) The rate at which a substance reacts, depends on its :
- (a) Active mass
- (b) Molecular mass
- (c) Equivalent mass
- (d) Total volume

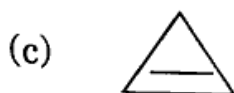
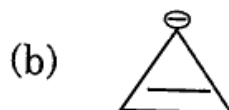
(viii) If pressure is applied to the equilibrium of solid $\rightleftharpoons$ liquid, the melting point of a solid :

- (a) will not change
- (b) may increase or decrease depending upon its nature
- (c) will always increase
- (d) will always decrease

(ix) The oxidation state of chromium in chromium trioxide is

- (a) +3
- (b) +4
- (c) +5
- (d) +6

(x) Which one of the following is anti-aromatic.



(d) None of the above

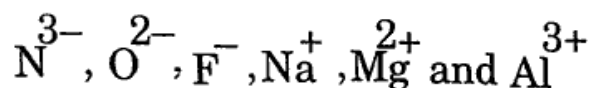
SECTION-B**(Very Short Answer Type Questions)**

(2 marks each)

2. Answer the following questions :

(i) Define law of multiple proportions. Explain with a suitable example.

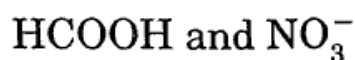
(ii) Consider the following species



(a) What is common in them?

(b) Arrange them in the order of increasing ionic radii

(iii) Draw the Lewis structures for the following molecules and ions



- (iv) Which out of NH_3 and NF_3 has higher Dipole moment and why?
- (v) In a process, 701 j of heat is absorbed by a system and 394 j of work is done by the system. What is the change in internal energy for the process.
- (vi) Define entropy change and write units of entropy change.
- (vii) Predict if the solutions of the following salts are neutral, acidic or basic NaCl , NaCN , NH_4NO_3 and KF .
- (viii) Write IUPAC names of the products obtained by the ozonolysis of the following compounds
- (a) Pent-2-ene
- (b) 1-phenylbut -1-ene
- (ix) What is difference between distillation and distillation under reduced pressure?

SECTION-C

(Short Answer Type Questions)

(3 marks each)

3. Answer the following questions.

- (i) State and explain first law of thermodynamics. Give its mathematical form.
- (ii) Calculate the mass percent of different elements present in sodium sulphate (Na_2SO_4).
- (iii) Explain, give reasons, which of the following sets of quantum numbers are not possible
- (a) $n = 1, l = 0, m = 0, s = +1$
 - (b) $n = 2, l = 0, m = -1, s = +\frac{1}{2}$
 - (c) $n = 2, l = 2, m = +1, s = -\frac{1}{2}$
 - (d) $n = 2, l = 1, m = 0, s = -\frac{1}{2}$

- (e) $n = 0, l = 1, m = 0, s = + \frac{1}{2}$
- (f) $n = 3, l = 1, m = 0, s = - \frac{1}{2}$
- (iv) Define electron affinity. What are its units. List three differences between electron affinity and Electro negativity.
- (v) Explain the concept of Resonance with suitable examples and define Resonance energy.
- (vi) Define the following
 - (a) pH of a solution
 - (b) Solubility product
 - (c) Common ion effect
- (vii) Discuss any three applications of redox reactions.
- (viii) Discuss the chemistry of lassaigne's test.

- (ix) Why is Wurtz reaction not preferred for the preparation of alkanes containing odd number of carbon atoms? Illustrate your answer by taking one example.

SECTION-D

(Long Answer Type Questions)

(5 marks each)

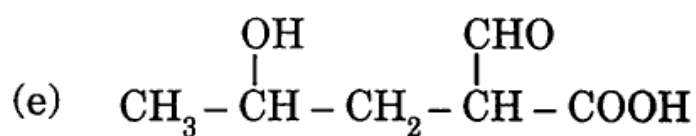
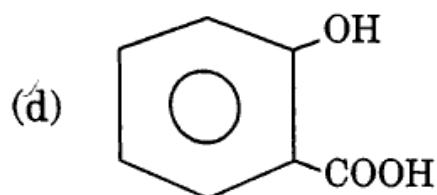
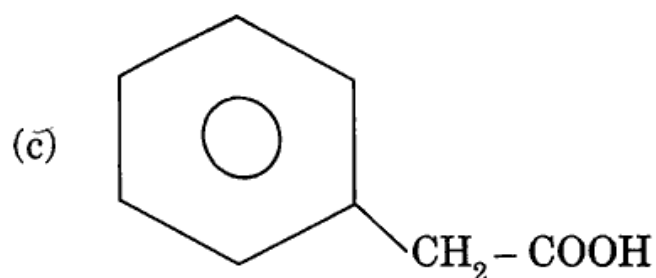
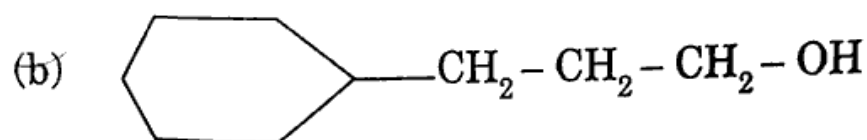
4. Answer the following questions.

- (i) (a) What is electromagnetic spectrum?
- (b) Explain Absorption spectrum.
- (c) How will you show that the spectral lines are the finger prints of the elements

OR

Write the main postulates of Bohr's theory. Explain the quantisation of energy. What are the limitations of Bohr's theory?

(ii) Write the IUPAC names of the following compounds.



Or

What are free radicals and carbanions? How are they generated? Explain the relative stability of alkyl free radicals and alkyl carbanions.

(iii) Write notes on

- (a) Wurtz reaction
- (b) Corey-House alkane synthesis
- (c) Huckel's rule

Or

How will you prepare the following compounds from benzene?

- (a) Chlorobenzene
- (b) Nitrobenzene
- (c) Toluene
- (d) Benzene Sulphonic Acid

Give the mechanism of nitration of benzene.