No. of Printed Pages : 4

Sem-II-Chem-GE-B_1(R&B)

2022

Time - 3 hours

Full Marks - 60

*Answer **all groups** as per instructions.*
Figures in the right hand margin indicate marks.

GROUP - A

1. Answer all questions and fill in the blanks as required. [1 × 8

(a) Write the designation for the orbital having n = 3 and l = 2.

(b) What is the bond order of He_2 ?

(c) Write the electronic configuration of Cu. How many unpaired electrons are there in it ?

(d) The shape of NH_4^+ is _____.

(e) Give an example of a neutral nucleophile.

(f) Dextro form rotates the plane polarized light to _____ direction.

(g) What product is formed during the dehydrohalogenation of $CH_3–CH_2–Br$?

(h) How can propyne br prepared ?

P.T.O.

GROUP - B

2. Answer any eight of the following within two or three sentences each. [1½ × 8

(a) Define polarisability.

(b) Write Borne-Lande equation with usual symbolical meanings.

(c) What is meso compound ? Give an example.

(d) Give an example of halogenation reaction.

(e) Name a method to determine lattice energy.

(f) Why half-filled and full-filled orbitals are more stable ?

(g) How is polarizing power of a cation related to its size and charge ?

(h) Draw the boat conformation of cyclohexane and show the flagpole hydrogens.

(i) Write the significance of ψ^2.

(j) Draw the picture of d_z^2 orbital.

GROUP - C

3. Answer any eight of the following within 75 words each. [2 × 8

(a) Draw the radial wave function of 1s and 2s orbitals.

(b) State and explain Huckel's rule with an example.

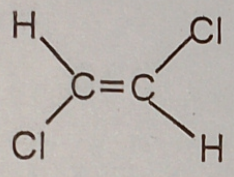
(c) What happens when CaC_2 is treated with water ? Give equation.

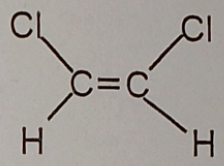
(d) Explain why aniline is a weaker base than cyclohexylamine.

(e) Calculate the bond order of CO by drawing MO diagram.

(f) What happens when propene is subjected to ozonolysis ? Give equation.

(g) Assign cis or trans to the following compounds.





(h) Predict the shapes of XeF_4 and SF_4 molecules on the basis of VSEPR theory.

(i) Draw the resonating structures of benzaldehyde.

(j) What are the two informations obtained about the orbital from azimuthal quantum number ?

GROUP - D

*Answer **any four** questions within 500 words each.*

4. What are quantum numbers ? Discuss the four types of quantum numbers with their significance. [6

P.T.O.

5. Discuss about the Heisenberg's uncertainty principle and concept of probability. [6

6. How can lattice energy of NaCl be determined by Born-Haber cycle ? Discuss its limitations. [6

7. What do you mean by hybridisation ? Discuss sp, sp^2 and sp^3 hybridisation with suitable examples. [6

8. Discuss CIP rules for assigning R and S notations. [6

9. Write notes on within 250 words each : [3 × 2

   (a) Carbanion

   (b) Hyperconjugation

10. Write notes on within 250 words each : [3 × 2

   (a) Birch reduction

   (b) Markownikoff's addition