

**CARMEL COLLEGE OF ARTS, SCIENCE & COMMERCE FOR
WOMEN, NUVEM-GOA**

SEMESTER END EXAMINATION JANUARY 2021

Semester: I of B.Sc.

Course name & Code: Inorganic Chemistry and Organic Chemistry CHC101

Total marks: 40

Duration: 2 hours

Total No of pages: 02

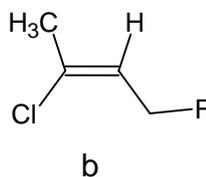
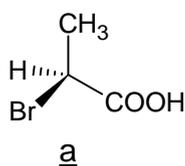
Instructions: 1) All questions are compulsory

2) Figures to the right indicate full marks

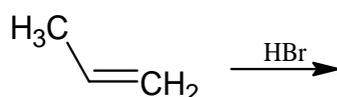
Q1. Answer any five of the following:

(2x5=10)

- i. Give the time independent Schrödinger wave equation and explain the different terms involved in it.
- ii. Give the most stable electronic configuration of Cu and S atoms.
- iii. a) Chose the correct alternative for the repulsion between different electron pairs
 - i) $bp-lp > bp-bp > lp-lp$
 - ii) $bp-bp > bp-lp > lp-lp$
 - iii) $lp-lp > bp-bp > lp-bp$
 - iv) $lp-lp > bp-lp > bp-bp$b) A π - bond is formed by _____ of atomic orbitals
 - i) axial (head-on) overlap
 - ii) lateral (side-on) overlap
- iv. a) A molecule has four lone pairs and two bond pairs. What will be the geometry of the molecule? Give an example of such a molecule.
b) A molecule has one lone pairs and three bond pairs. What will be the geometry of the molecule? Give an example of such a molecule.
- v. How will you synthesize Ethane via Kolbe's electrolysis?
- vi. Explain Resonance effect with a suitable example.
- vii. Assign E/Z & R/S configuration (wherever applicable) for the following compounds?



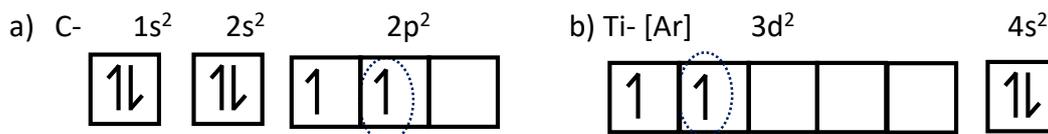
- viii. Predict the product(s) for the following:



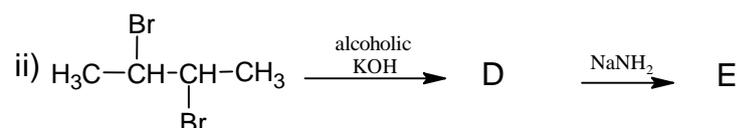
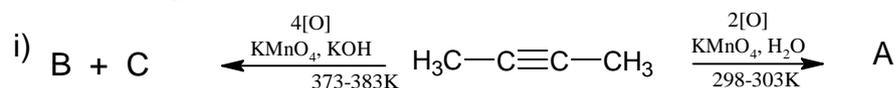
Q2. Answer any six of the following:

(5x6=30)

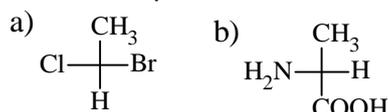
- i. Write a short note on magnetic quantum number. The electronic configuration of two atoms are given below, determine the four quantum numbers of the electrons circled.



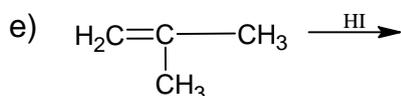
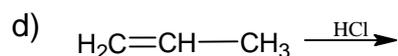
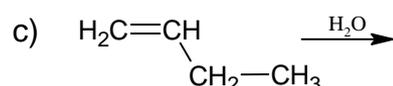
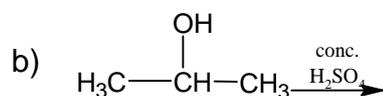
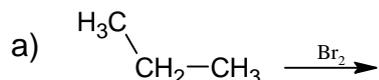
- ii. Calculate the number of radial and angular nodes in a 3p and 4s orbital of a hydrogen like atom. Give a trace of the radial function and the radial probability distribution curves of a 2p orbital. Determine the nodes in these graphs and the radius of maximum probability of finding the electron.
- iii. Draw the molecular orbital diagram of N₂ molecule. Calculate the bond order of this molecule and comment on the same. Write the electronic configuration of this molecules and comment on its magnetic properties.
- iv. Using the concept of hybridization explain the bonding and structure of BF₃ molecule.
- v. Complete the following:



- vi. What are carbocations? Comment on its structure and stability.
- vii. Assign R/S configuration and draw staggered conformations in both the sawhorse and Newman representations of the following compounds:



- viii. Predict the product(s) for the following:



***** ALL THE BEST*****