**Q1-A**/Define and give example for the following

**1-** Hydrogen bonds **2-** Geometric isomers **1-** Electronegativity **2-** Conformational isomers

**B/** Fill the blank by choosing one correct answer from below:

**1.**The O-H bond in alcohols classified as ----------bond

**a-**polar covalent **b-**covalent **c-**ionic

**2**.P orbitals overlap ----------form bond known as a pi (π) bond.

**a-**side-to-side **b-**head-to-head **c-**side-to-head

**3.**----------alcohol mean that it has an alcohol functional group (-OH) bonded to a carbon atom that is itself bonded to three other carbons.

**a-**Primary **b-**Secondary **c-** Tertiary

**4.**Combustion is a rapid oxidation takes place at high temperatures, converting alkanes to ---------and water

**a-**carbon monoxide **b-**carbon dioxide **c-**carbon

**5.**Homolytic cleavage is bond breaking in which the bonding electron pair is split evenly between the products and produces ---------.

**a-**anion **b-**cation **c-**radicals

6.The C-C bond in alkanes classified as ----------bond

**a-**polar covalent **b-**covalent **c-**ionic

**7.** P orbitals overlap ----------form bond known as a pi (π) bond.

**a-**side-to-side **b-**head-to-head **c-**side-to-head

**8.** ----------alcohol mean that it has an alcohol functional group (-OH) bonded to a carbon atom that is itself bonded to one other carbon.

**a-**Primary **b-**Secondary **c-** Tertiary

**9.** Hydration reaction is ----------of water molecules to unsaturated bonds.

**a-**substitution **b-**addition **c-**elimination

**10** Markovnikov selectivity was observed in the reactions that proceed along the --------pathway”.

**a-**carbanion **b-** carbocation **c-**radical

**Q2/**

**A-**Draw and named two conformation isomers of butane resulted from rotation about the C2-C3 single bond and identify the stable one.

**B-**Three different alkyl halides are obtained from the monochlorination of pentane, explain.

**C-**Writ the mechanism of propene hydration.

**D-** Cyclopentane is more stable than cyclopropane, why?

**E-**Two different alkyl halides are obtained from the monochlorination of butane, explain.

**F-**Writ the mechanism for the reaction of propene hydrogen bromide.

**Q3/**Complete the following equation: (21Marks)





**Correct the following sentences:(without changing the bold words**

1. Some carbon compounds are considered to be organic such as **diamond and graphite.**
2. **Carbon** has the property of forming triple bonds only with itself and with other atoms.
3. The combination of two sp2 hybridized carbon atom leads to two carbon atoms being joined by the side-to head overlap of sp2 orbitals to form a C-C **single bond**.
4. Benzene is soluble in **water** but immiscible in **organic solvents**.
5. Heterolytic bond cleavage: Bond breaking in which the bonding electron pair is **split evenly** between the products.
6. Cyclopentane and cyclobutane are especially **abundant in nature** and have received special attention.
7. Double bonds that **alternate** with single bonds are said to cumulated and the one that are separated by more than one single bond are said to be isolated.

**B/ Prepare *p*-bromonitrobenzene from benzene (use suitable reagent and condition).**

**Q2/Answer the following: only five**

1. Alkanes are good lubricants and preservatives for metals, why?
2. Compere between the stability of cyclopropane and cyclopentane.
3. Nitrobenzene is favored meta substitution, when it is involved in electrophilic aromatic substitution reaction, why?
4. Alkynes has acidic nature, why?
5. Write the mechanism of alcohol dehydration.
6. Write the mechanism of benzene Friedel–Crafts acylation.

**Write the chemical equation following reaction:**

1. 1,3-Butadiene + HCl
2. Acetylene + 2H2 (Pd/C)
3. Pent-2-yne + 2eq.HBr in CH3COOH
4. 1,2-dibromopropane + NaNH2
5. Benzene + 3Br2 under UV light/ heat
6. Phenol + Zn/heat
7. CaC2 + 2H2O
8. Benzene + I2/HNO3