



4. a) Define electrophilic substitution reaction. 5  
Explain reaction and mechanism of Nitration.

b) What are activating and deactivating groups? Explain the influence of hydroxyl group in phenol. 5

**OR**

c) Discuss molecular orbital structure of benzene. 2½

d) What is meta-directing effect? Explain it in nitrobenzene. 2½

e) Write note on 'Huckel's rule' of Aromaticity. 2½

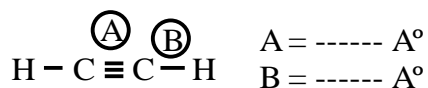
f) Write note on 'Friedel-Craft alkylation'. 2½

5. Attempt **any ten**. 1x10

1) Define bond length with suitable example.

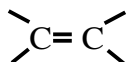
2) Mention salient features of Electrometric effect.

3) What are bond length in following acetylene molecule –



4) Write two possible functional isomer from molecular formula -  $\text{C}_3\text{H}_6\text{O}$ .

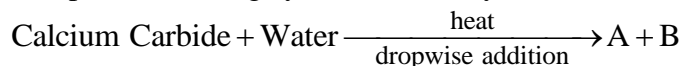
5) Draw E and Z form by using H-atom & methyl group around



6) Define – Asymmetric carbon atom.

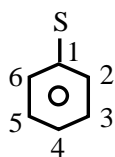
7) What is CNG? Mention its two applications.

8) Complete following synthesis of acetylene & write in formula –



9) What is peroxide effect?

10) Identify ortho, meta & para position with respect to first substituent –



11) Identify ortho-para & meta directing group from  $-\text{CH}_3$  &  $-\text{NO}_2$ .

12) Draw two possible Kekule structure for benzene.

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