V92/S37131/EE/20160712

Time : 3 Hours **Marks : 80**

Instructions :

1. All Questions are Compulsory.
2. Each Sub-question carry 5 marks.
3. Each Sub-question should be answered between 75 to 100 words. Write every questions answer on separate page.
4. Question paper of 80 Marks, it will be converted in to your programme structure marks.

1. Solve any **four** sub-questions.
   a) Explain the principle quantum number and azimuthal quantum number. 5
   b) Give the rules for filling electrons in various orbitals. 5
   c) Give the general characteristics of ionic bonding. 5
   d) What happens when alkane undergoes free radical substitution and Halogenation? 5
   e) How will you synthesis alkyne from dehalogenation of tetra halides? 5

2. Solve any **four** sub-questions.
   a) Give the chemical reaction of alkynes : 5
      i) Ozonolysis
      ii) Oxidation with hot alkynes $KMNO_4$
   b) Explain magnetic spin quantum number. 5
   c) Give the rules for the LCAO method. 5
   d) Explain Born-Haber cycle. 5
   e) What happens when bromine and alkaline $KMNO_4$ is added with Alkyne? 5

3. Solve any **four** sub-questions.
   a) Explain the Fajan's rule. 5
   b) Explain the bonding and antibonding molecular orbital and their characteristics. 5
   c) Explain the stability of half-filled and completely filled orbital. 5
   d) Explain ionic character in ionic compound. 5
   e) Explain concept of exchange of energy. 5

4. Solve any **four** sub-questions.

a) Give the chemical reaction of alkyne that

i) formation of metal acetylide

ii) addition of bromine. 5

b) Explain the relative energies of atomic orbital. 5

c) Explain dipole moment and percentage ionic character. 5

d) Give the statement of Born-Lande equation for calculation of lattice energy. 5

e) Explain the S-S and S-P combination of atomic orbitals. 5