

5. a) Why is TMS used as a reference for NMR analysis? [2]
b) Find the distance of separation between C^{13} & O^{16} in CO molecule if the spacing between the consecutive vibrational spectra is 89.45 cm^{-1} [4]
c) How does hydrogen bonding change the position of absorption in the Infra-red spectroscopy? [3]
6. a) Describe the basic principles of mass spectroscopy. [5]
b) Predict the structure of the compound whose m/e values peaks in the mass spectrum are 100, 85, 71, 57, 43(base), 41, 29 and 27. [4]
7. a) A volatile organic compound with molecular mass 130 contains 73.85% C, 13.5% H. The compound is transparent above $210\text{m}\mu$ in UV region. In IR spectra bands are formed at $2960\text{-}2851(\text{m})$, $1342(\text{w})$ and $1075\text{ cm}^{-1}(\text{s})$. Only one signal is obtained at 8.95ζ in NMR spectrum. Find the structural formula of the compound. [7]
b) What do mean by thin layer chromatography? [2]
8. Write short notes on any Three: [3x3]
a) HPLC
b) Types of bending vibration
c) Instrumentation of mass spectroscopy
d) Spin-Spin Coupling
e) Transition probability.