



THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions. (6x5=30)

- a) How will you distinguish between *p*-Xylene and mesitylene by ¹H-NMR spectroscopy?
- b) What arrangement of protons would give two triplets of equal area? Explain with the help of structure.
- c) The mass spectrum of butyraldehyde, CH₃CH₂CH₂CHO, shows a prominent peak at m/z 44. How will you explain it?
- d) How would you distinguish between primary, secondary and tertiary butyl alcohols by mass spectrometry?
- e) What are α-Amyrin and β-Amyrin? Give their importance.
- f) Briefly describe the classification of steroids.

Q.2. Answer the following questions. (3x10=30)

- a) How many signals would you expect to find in the ¹H-NMR spectrum of each of the following compounds?
 - (i) Butane
 - (ii) 2-Bromobutane
 - (iii) Vinyl bromide
 - (iv) 1-Butanol
 - (v) 2-Methyl-2-butene
- b) What fragments are expected from the McLafferty rearrangement in the following compounds.
 - (i) 5-Methyl hexanal
 - (ii) 4-Methyl-2-pentanone
 - (iii) 2-Butyl cyclohexanone
 - (iv) Butyl-2,2-dimethyl propanoate
 - (v) 2-Ethylhexanoic acid
- c) Write a note on terpenoids. Also explain the general methods of structure determination of terpenoids.