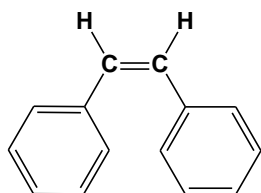


## Tutorial I

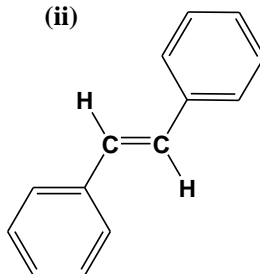
### Spectroscopy (January 2023)

1. Explain why butadiene exhibits a higher value of  $\lambda_{\text{max}}$  for  $\pi$ - $\pi^*$  transition than that of ethylene.
2. How can you identify the cis-isomer from UV-Visible spectrum

(i)

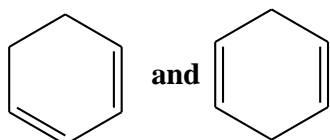


(ii)

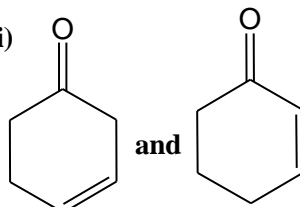


3. How can you distinguish between the following pairs of compounds using UV-Visible spectroscopy ?

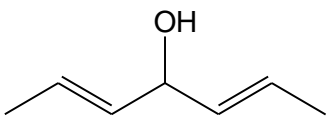
(i)



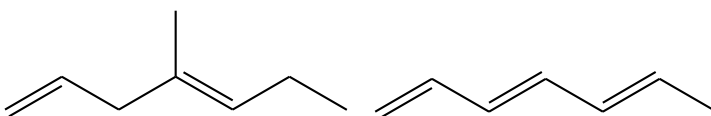
(ii)



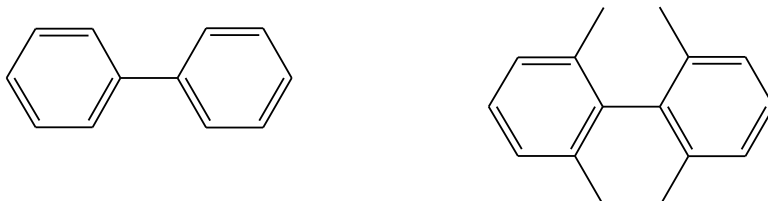
(iii)



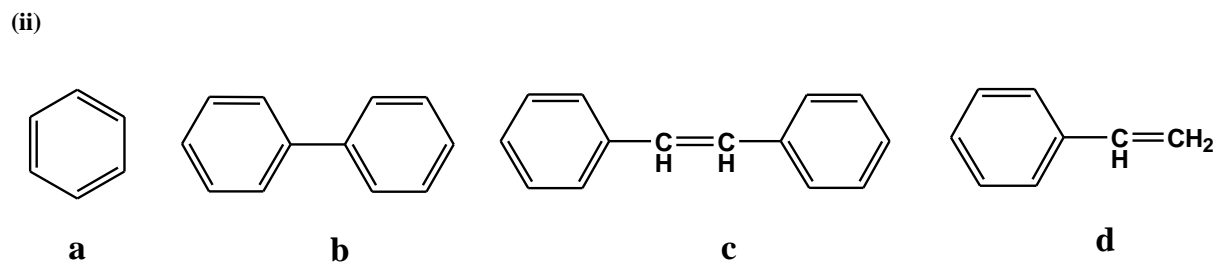
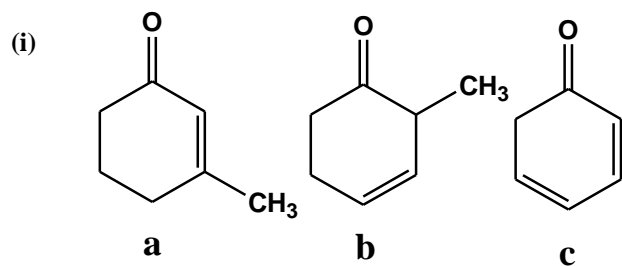
(iv)



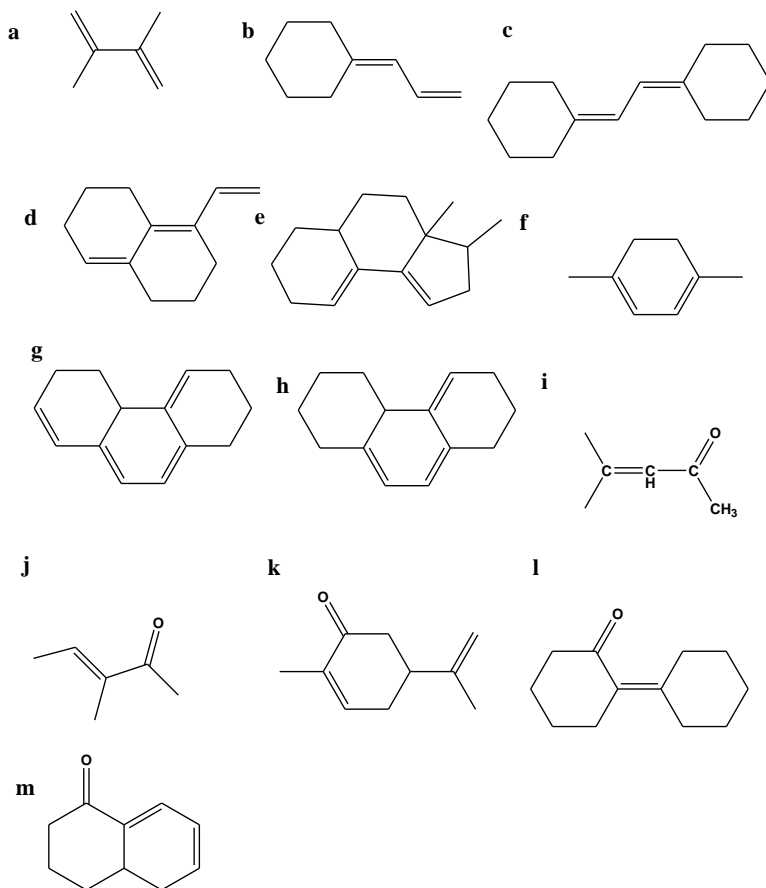
(v)



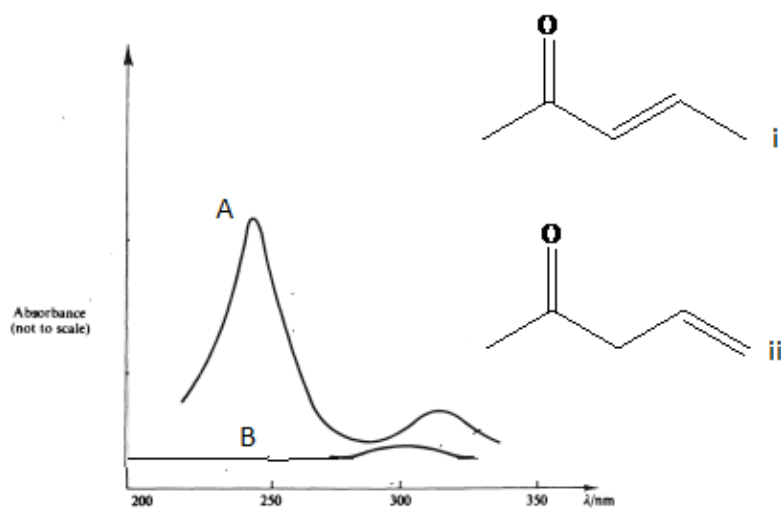
4. Rank the compounds in each group in the order of decreasing  $\lambda_{\text{max}}$ .



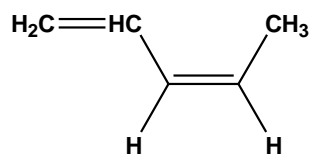
5. Calculate  $\lambda_{\text{max}}$  using Woodward-Fieser rules



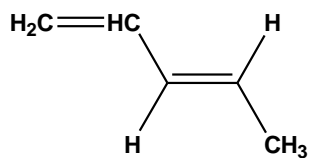
6. Assign the spectra to the following compounds



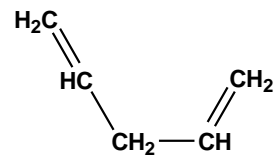
7. Assign with justification the  $\lambda_{\text{max}}$  values of 176, 211 and 215 nm to the dienes given below.



a



b



c