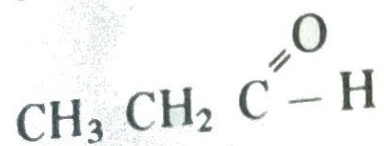


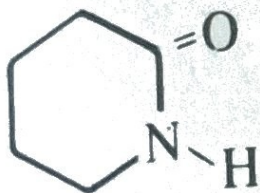
Q-1

In which of the eight infrared spectral regions listed above would the following compound be expected to absorb light? What bond gives rise to each absorption?



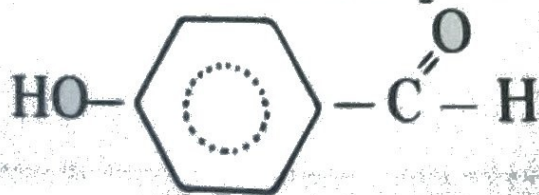
Q-2

In which of the eight spectral regions would the following compound be expected to absorb light?



Q-3

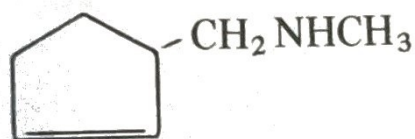
In which of the eight spectral regions would the following compound be expected to absorb light? To what type of vibration would each absorption be due?



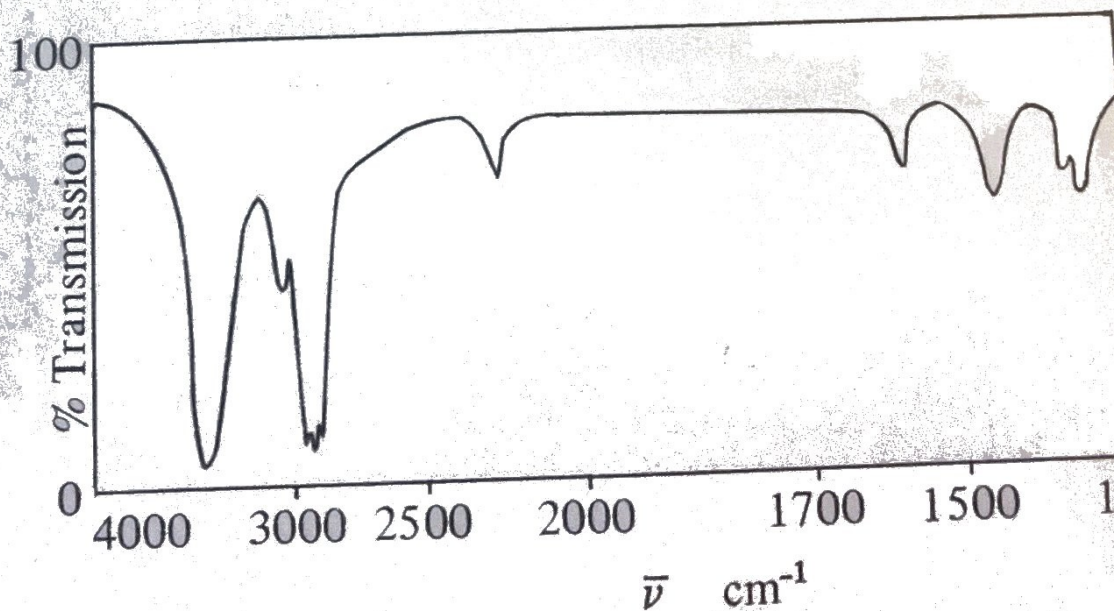
- Q-4 In which of the eight spectral regions would the following compound be expected to absorb light? To what type of vibration would the absorptions be due?



- Q-5 In which of the eight spectral regions would the following compound be expected to absorb light? To what type of vibration would each absorption be due?



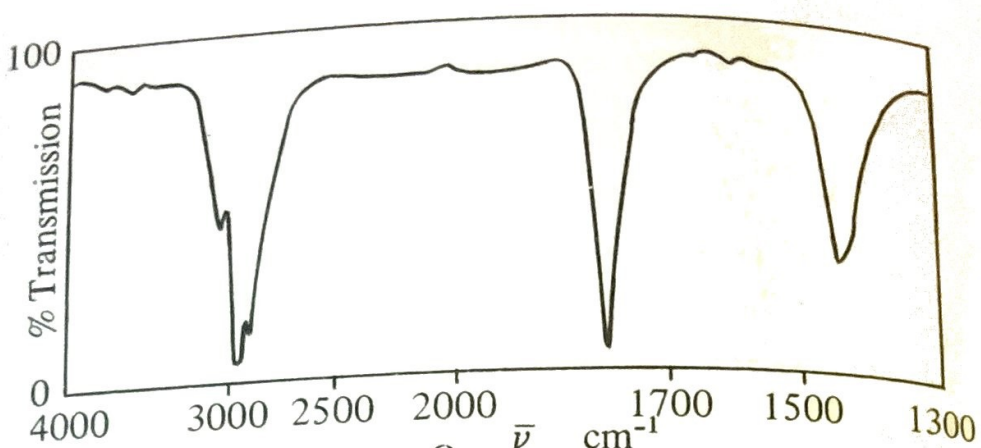
- Q-6 Below is a portion of the infrared spectrum of a compound. What types of groups are possible? What types of groups are known to be absent?





Q-7

Below is a partial spectrum of a compound which is known to have either structure I or II. Which structure is *not* consistent with the spectrum? Why?



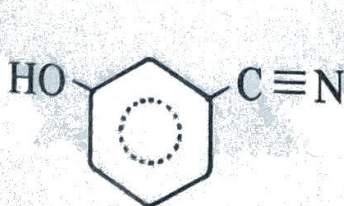
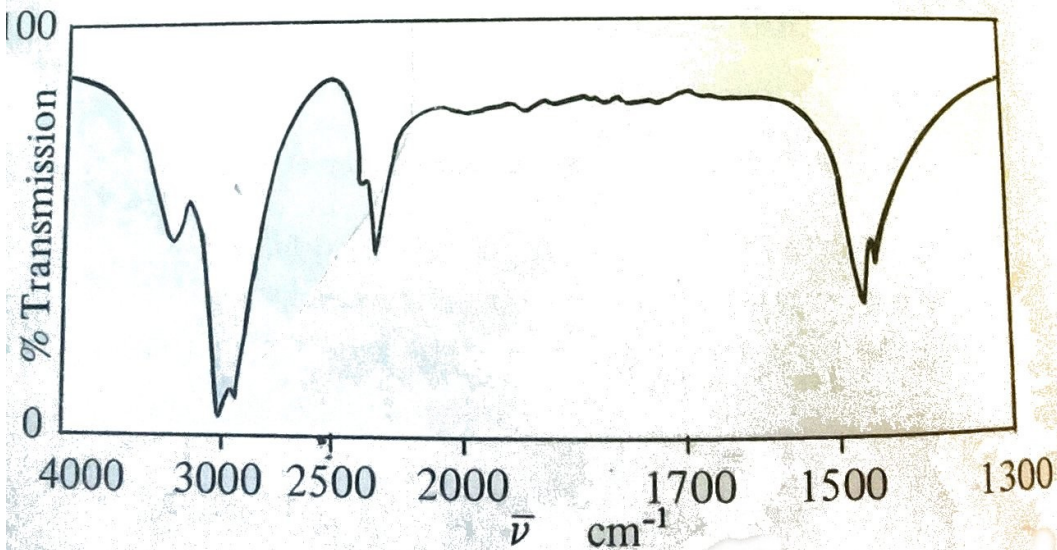
I



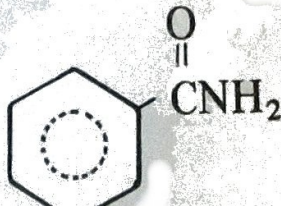
II

Q-8

Below is a partial spectrum of a compound which is known to have either structure I or II. Which structure is *not* consistent with the spectrum? Why?

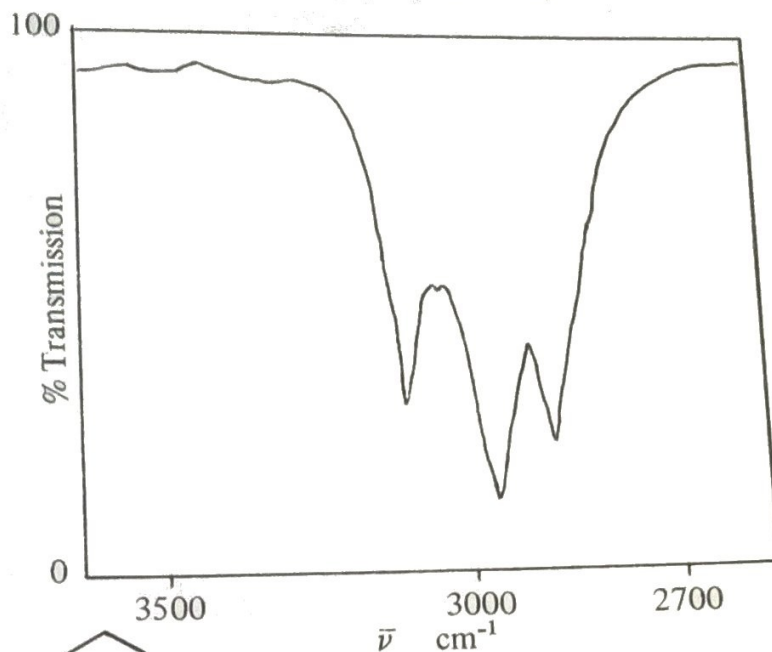


I



II

Q-9 A portion of the infrared spectrum of a molecule known to have either structure I or II is given below. Which structure is consistent with the spectrum? Why?

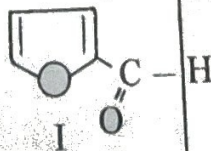
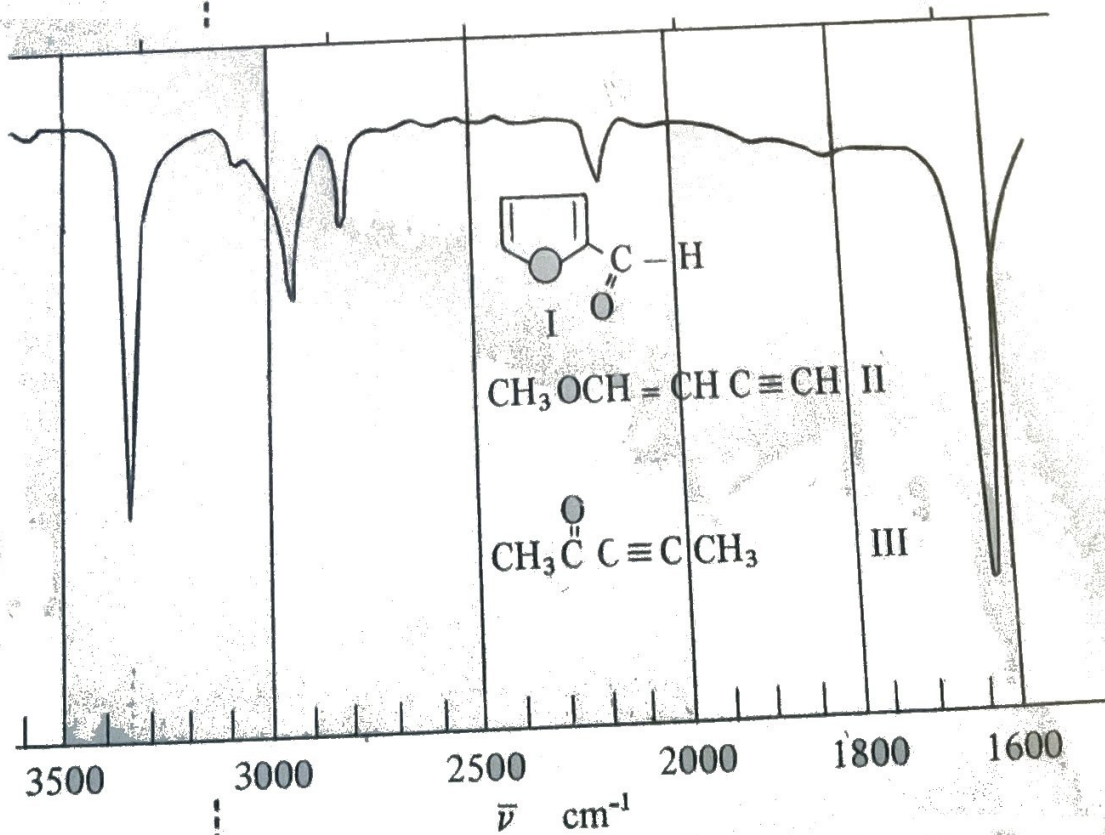


I



II

Q-10 A portion of the infrared spectrum of a molecule known to have structure I, II, or III is given below. Which structure is consistent with the spectrum? Why?

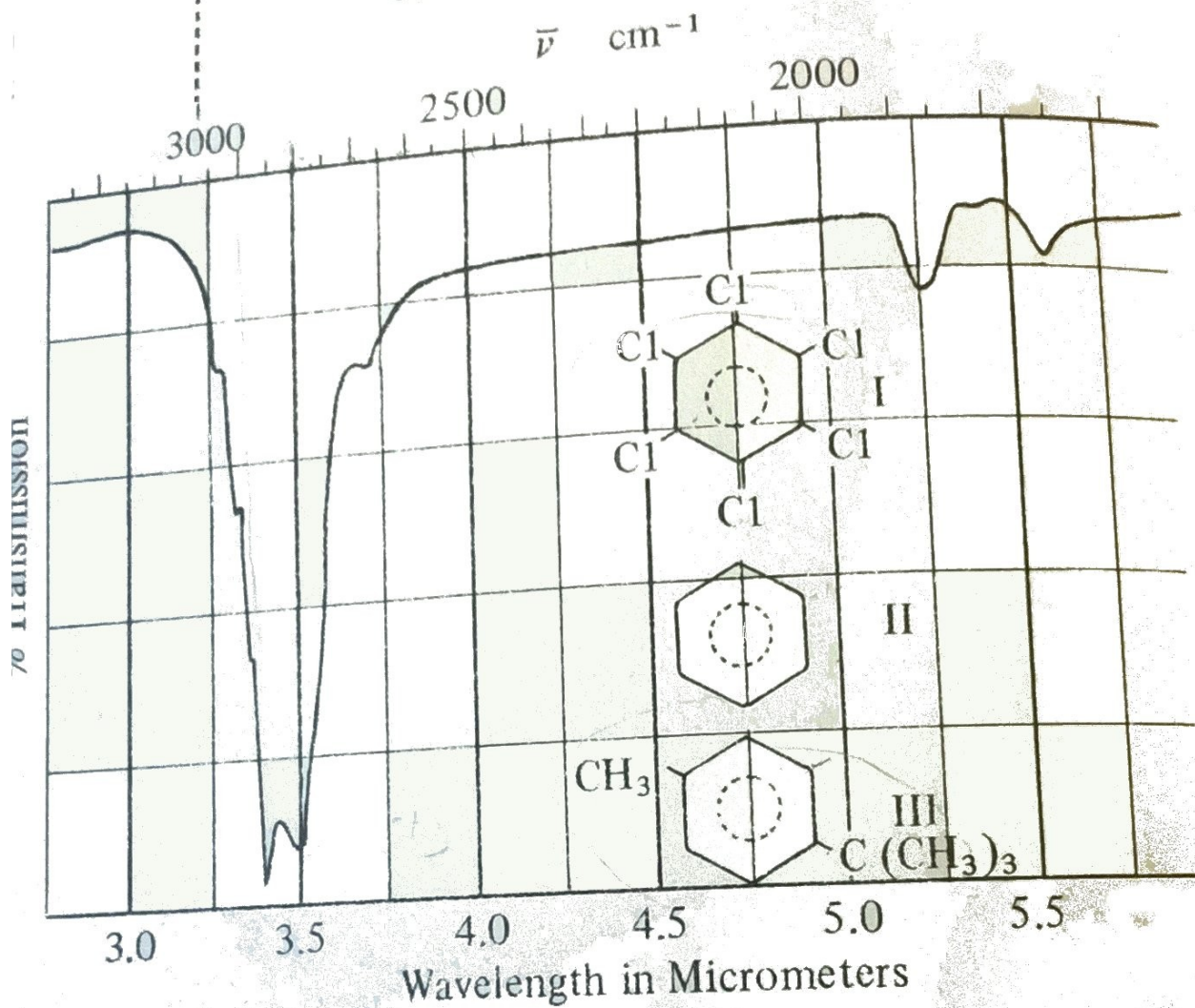


I



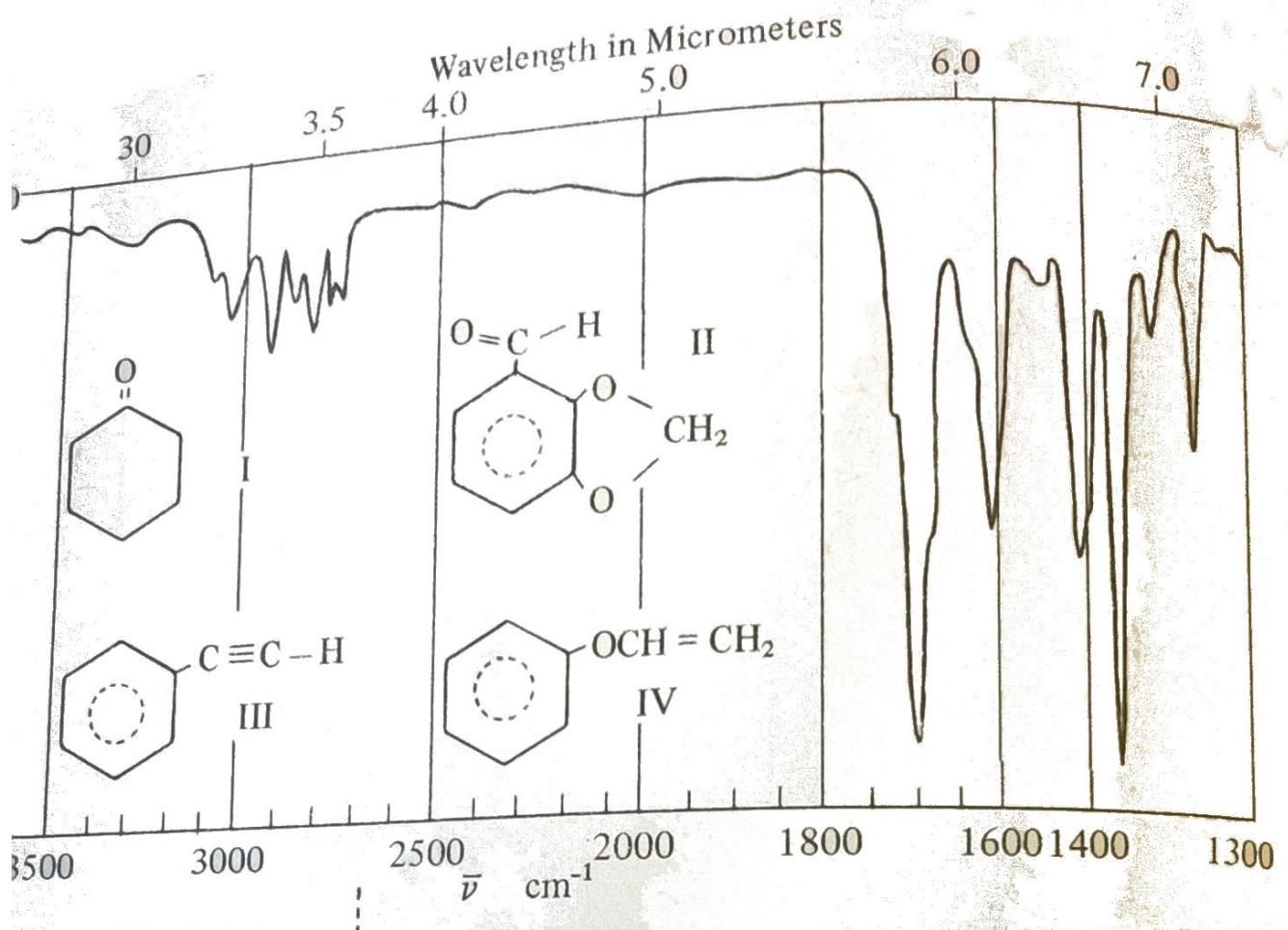
III

Q-11 A portion of the infrared spectrum of a molecule known to have structure I, II, or III is given below. Which structure is consistent with the spectrum? Why?





Q-12 A compound whose spectrum appears below was thought to have structure I, II, III, or IV. Which structure is most nearly consistent with the spectrum?



- Q-13 Indicate the absorptions expected in the spectrum of the following compound. The spectrum was obtained of a *neat* sample (i.e., no solvent was present).



- Q-14 Indicate the absorption expected for the following compound.



- Q-15 A very dilute solution of *cis*-cyclopentane-1, 2-diol in  $\text{CCl}_4$  shows bands at 3620 and 3455  $\text{cm}^{-1}$ . Explain.

- Q-16 How would the infrared spectra of the following compounds differ?

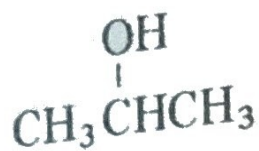


- Q-17 How would the infrared spectra of the following compounds differ?





Q-18 How would the infrared spectra of the following compounds differ (neat samples)?

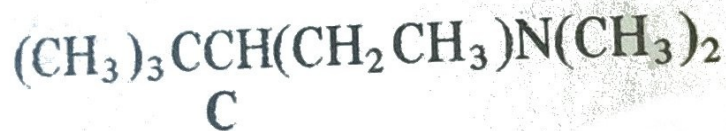


Q-19 How would the infrared spectra of the following compounds differ (neat samples)?



A

B



C

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Q-20 How would the infrared spectra of the following compounds differ (neat samples)?

