

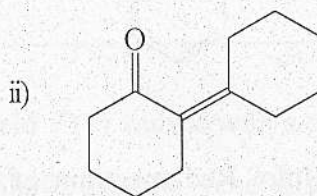
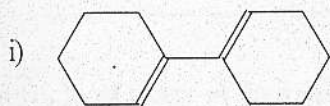


EASTERN UNIVERSITY, SRI LANKA
SECOND EXAMINATION IN SCIENCE 2005/2006
SECOND SEMESTER (March/April 2008) -REPEAT
CH 203 SPECTROSCOPIC METHODS

Time allowed: **ONE Hour**

Answer all questions

- 1) a) Predict the UV maximum for each of the following compounds.

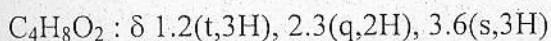


(30 marks)

- b) The mass spectrum of $\text{PhCH}_2\text{OCOCH}_3$ showed fragmentations at 150, 108, 107, 79 and 77. Give the structures of these ions and indicate the possible pathways for their formation.

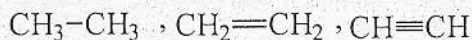
(35 marks)

- c) Propose a structure for the compound that fit the following data.



(20 marks)

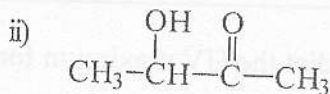
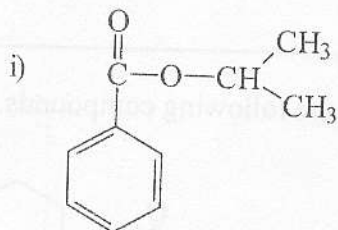
- d) Give the increasing order of the C-C vibrational frequencies of the following compounds. Give reason(s) for your answer.



(15 marks)

Cont.

- 2) a) Sketch the ^1H NMR spectrum including the splitting pattern expected for each of the following compounds with TMS as a standard. Predict the approximate chemical shift in each of the spectra.



(30 marks)

- b) The Infra Red spectrum of a compound **R** ($\text{C}_8\text{H}_8\text{O}_2$) showed absorptions at about 3200 cm^{-1} (broad band), 3010 cm^{-1} , 2900 cm^{-1} , 1700 cm^{-1} , 1200 cm^{-1} , 750 cm^{-1} and 690 cm^{-1} . ^1H NMR spectrum of the compound had signals at δ 10.6(s,1H), δ 7.4(s,5H), and δ 3.6 (s,2H). Interpret the spectral data and deduce the structure of the compound **R**.

(60 marks)

- c) The mass spectrum of an organic compound had peaks of 1:2:1 intensity at M , $M+2$ and $M+4$. What inference would you make from this observation (no details required)?

(10 marks)

End