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The Open University of Sri Lanka  
 B. Sc Degree / Stand Alone Programme 2006/2007  
 Organic Chemistry - CHU 2221  
 Level 4 - Assignment I - Open Book Test  
 Duration 1½ hours

Q	Marks	
	Max	Awarded
1	20	
2	20	
3	20	
4	40	
Total		

Saturday 23<sup>rd</sup> September

Time: 4.00 p.m. – 5.30 p.m.

Answer all questions.

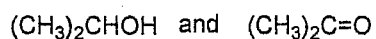
1. Give the structure of the **major product** of the following reactions in the appropriate cage. Classify each of the reactions as substitution, elimination, addition or acid-base.

	Reaction	Major Product	Reaction type
a	$\xrightarrow{(\text{CH}_3)_2\text{CuLi}}$		
b	$\xrightarrow{\text{Cl}_2 / h\nu}$		
c	$\text{CH}_3\text{CH}_2\text{CH}_2\overset{\text{N}(\text{CH}_3)_3}{\underset{\text{OH}}{\text{C}}}\text{CH}_3 \xrightarrow{140^\circ\text{C}}$		
d	$\text{CH}_3\text{CH}_2\overset{\text{CH}_3}{\text{C}}\text{HMgBr} \xrightarrow{\text{D}_2\text{O}}$		
e	$\text{CH}_3\text{CH}_2\overset{\text{CH}_3}{\text{C}}=\text{CH}_2 \xrightarrow{\text{Pd-C} / \text{H}_2}$		

(20 Marks)

2. a. Explain why electrophiles preferentially react at *ortho* and *para* positions of toluene.

- b. Giving reasons, state which shows higher boiling point from the following pair of compounds.



(20 Marks)

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3. You are provided with **four (04)** IR spectra labeled **1, 2, 3** and **4** and structures of **ten (10)** compounds labeled **A - J**. In the boxes below in front of each spectrum number write the structure identification letter of the most probable structure which fit the each spectrum. Give reasons. *Please do not draw structures*

Spectrum	Compound	Reasons
1		
2		
3		
4		

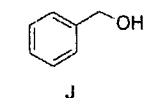
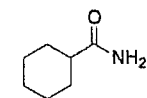
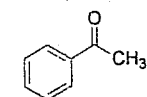
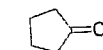
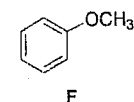
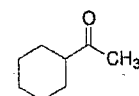
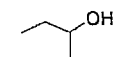
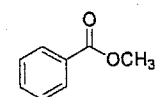
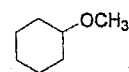
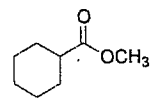
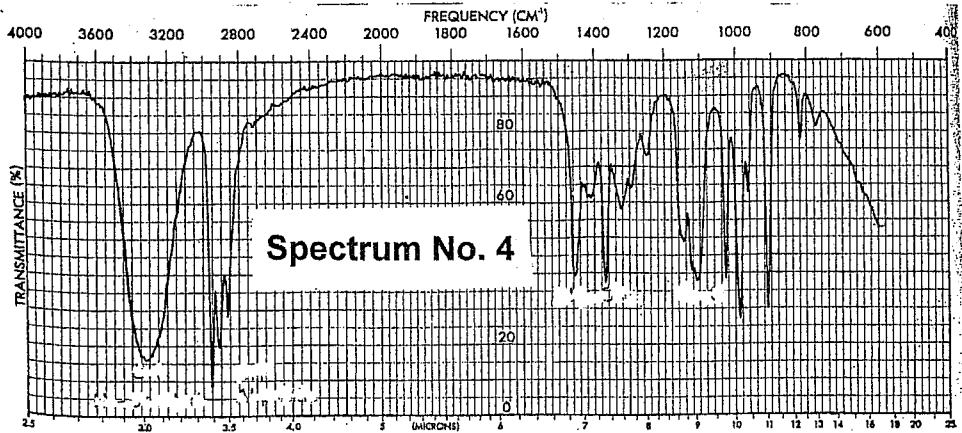
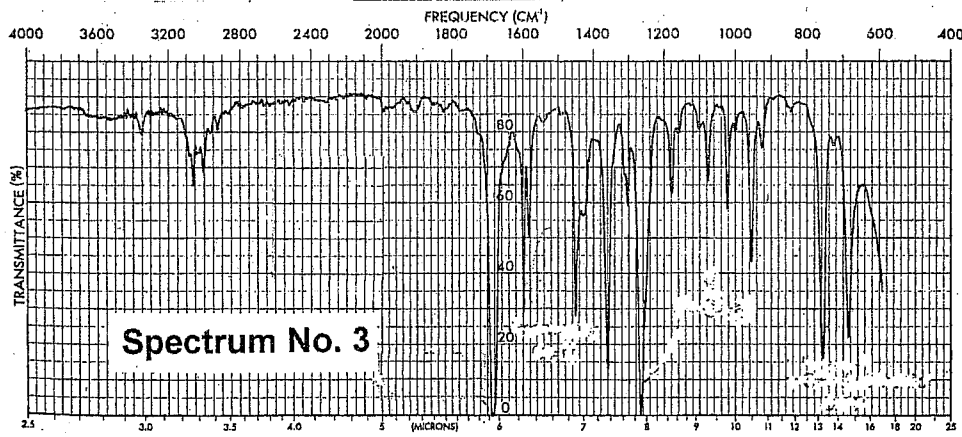
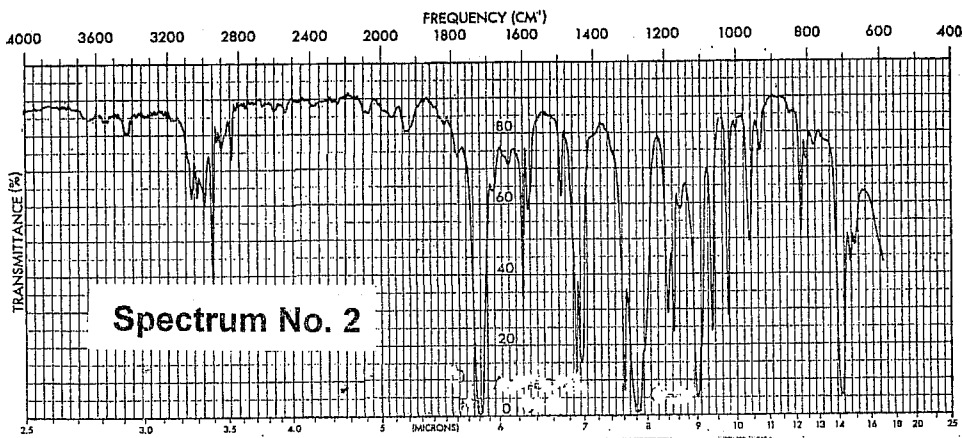
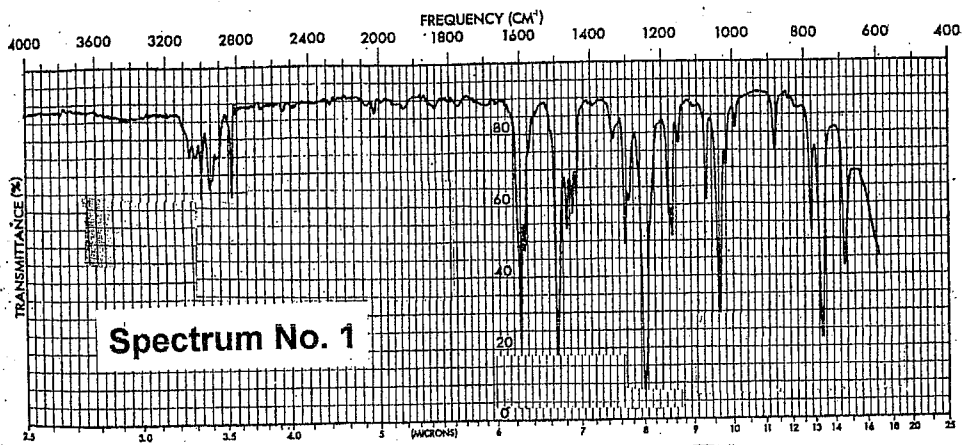
(20 Marks)

4. Deduce the structure of the compound **P** ( $C_8H_5NO_2$ ) whose IR and  $^1H$  NMR spectra are provided. (*Write your answer only in the following box. Answers written in additional sheets are not marked*)

(40 Marks)

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### IR Spectra and structures for Question No. 3



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IR and  $^1\text{H}$  NMR spectra for Question No. 4

