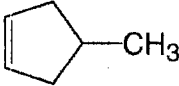
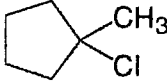


The Open University of Sri Lanka
 B.Sc Degree/Stand Alone Programme 2006/2007
 Organic Chemistry
 CHU 2221 Assignment test I
 Answer guide

1.

	Major product	Reaction type
a		Substitution
b		Substitution
c	$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}=\text{CH}_2$	Elimination
d	$\begin{array}{c} \text{D} \\ \\ \text{CH}_3\text{CH}_2\text{CHCH}_3 \end{array}$	Acid -Base
e	$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3\text{CH}_2\text{CHCH}_3 \end{array}$	Addition

- 2 a. *Ortho* and *para* positions of the benzene ring becomes more electron rich than the meta positions due to the hyper-conjugative effect of toluene. Therefore electrophiles preferentially attack on those positions.

Read Part I Page 23-24 to see how you could draw resonance structures due to hyper-conjugation

- c. Intermolecular attractive forces present in alcohol are H-bonding, whereas those of propanone are dipole-dipole interactions. H-bonds are stronger than dipole-dipole attractive forces and more energy is required to separate molecules by breaking H-bonds. Therefore boiling point of 2-propanol is higher than propanone.

Read Part I page 130

3

Spectrum	Compound	Reasons
1	F	1250 cm ⁻¹ , C-O stretching, 1400-1600 cm ⁻¹ benzen ring
2	C	1720 cm ⁻¹ , O=C - OR Conjugated, 1400-1600 cm ⁻¹ benzene ring
3	H	1690 cm ⁻¹ , O=C Conjugated, C=O, 1400-1600 cm ⁻¹ benzene ring
4	D	3400 cm ⁻¹ - broad peak H-bonded OH group

4.

IR spectrum

3251 cm⁻¹ ≡C-H, 2105 cm⁻¹ -C≡C-, 1600 cm⁻¹ aromatic C=C, 1511 cm⁻¹ and 1343 cm⁻¹ NO₂ Group

H¹ NMR

Singlet Doublet
 δ 3.2 δ 7.6 δ 8.2

Area ratio 1 : 2 : 2

Three types of H's

δ 7.6 }
 δ 8.2 } two doublets para disubstituted benzene

δ (7.6 - 8.2) Aromatic ring protons

δ 3.2 -C≡C-H

