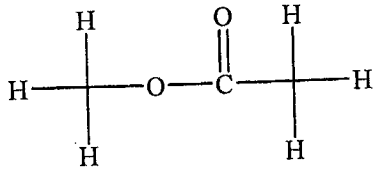
Uva Wellassa University of Sri Lanka
End Semester Examination – March 2012
SCT 232-1 Organic Chemistry

Uva Wellassa University

Time: One (01) hour

Total four (4) questions
Question No 01 is compulsory
Answer three (3) questions including question No 01

01. a. Sketch the ^{1}H-NMR spectrum of the *Compound A* showing the distance from TMS, relative areas (integration) and multiplicity of the signals.



Compound A

(15 marks)

b. Consider the *Compound B* ($C_6H_{11}O_2Br$) having the following spectral data:

IR $\sqrt{}_{max}$ (cm^{-1})	1711 (strong peak) and 3000 (broad band)
^{1}H-NMR δ_{ppm}	1.45 (m, 2H), 1.52 (m, 2H), 1.82 (m, 2H), 2.30 (t, 2H) 3.51(t, 2H) and 11.0 (singlet, D_2O exchangeable, 1H)
^{13}C-NMR δ_{ppm}	23, 27, 32, 33, 34 and 179
Mass spectrum: *m/z*	60, 115, 194 and 196

i. What is/are the functional group/s that can be expected according to IR data of *Compound B*.

(6 marks)

ii. Deduce the structure of *Compound B*.

(25 marks)

iii. State the reasons for mass spectrum signals of *Compound B* at *m/z* 194 and 196.

(4 marks)

02. a. Compare the effects of following factors on the rate of S_N1 and S_N2 reactions:

i. Substrate structure

ii. Nucleophile

(10 marks)

b. "Optically active starting materials give racemization of stereochemistry at the reaction centre by S_N1 reactions but S_N2 reactions give inversion of stereochemistry at the reaction centre". Explain. Use illustrations where necessary.

(15 marks)

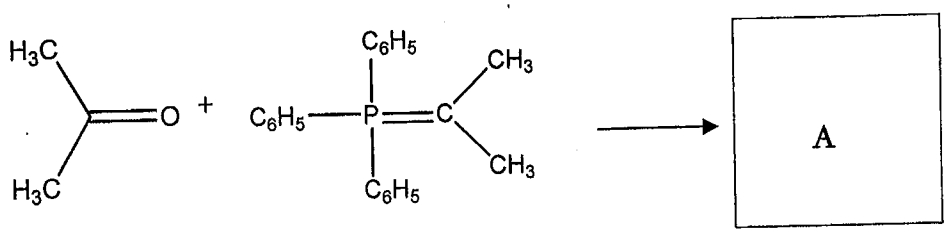
03. a. Give the mechanism for Claisan condenzation reaction of ethyl acetate in the presence of NaOEt.

(10 marks)

b. Give the mechanism for the aldol reaction of ethanal in the presence of NaOH.

(10 marks)

c. Draw the structures of the products A.



(5 marks)

04. a. Give the mechanism for the Friddle-Craft alkylation reaction of benzene using $(CH_3)_2CHCl$ /$AlCl_3$

(17 marks)

b. Give the structures of the product obtain from the reaction of following compounds with CH_3Cl /$AlCl_3$.

i. C_6H_6

ii. $C_6H_5NH_2$

iii. $C_6H_5NO_2$

iv. C_6H_5Cl

(8 marks)