Total No. of Questions : 6]

SEAT No. :

P1862

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M.Sc. - I

ORGANIC CHEMISTRY

CHO-250 : Synthetic Organic Chemistry & Spectroscopy

(2013 Pattern) (Semester-II) (New - 5 Credits)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***All questions are compulsory.***
3) ***Figures to the right indicate full marks.***

SECTION-I

Q1) Attempt any three of the following: **[9]**

a) Cyclohexanone on reaction with methylene triphenyl phosphorane gives exo double bond (exo alkene) while reaction with dimethyl sulfonium methylide forms epoxide.

b) Reformatsky reagent is prepared with Zinc (Zn) i.e. $ZnBrCH_2COOE+$ and not with Magnesium(Mg) or Lithium(Li).

c) $Ph_2C(OH)C(OH)MePh$ on treatment with acid catalyst H^+ forms triphenyl methyl, methyl ketone ph_3c co me

d) In P-Nitro acetanilide two doublet J = $8H_2$ are observed, One doublet is observed at higher field than other.

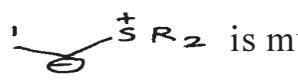
Q2) Attempt any four of the following: **[8]**

a) What is wilkinsons catalyst give its any one selective application.

b) What is MPV reduction explain with suitable example.

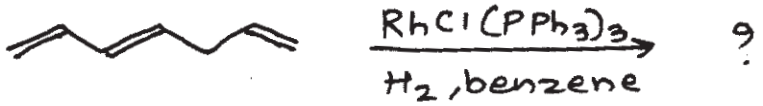
c) How Anthranilic acid is prepared by any one of the rearrangement reaction.

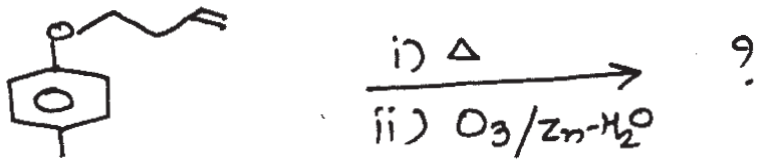
d) R_2CuLi can be used for conjugate addition of enone.

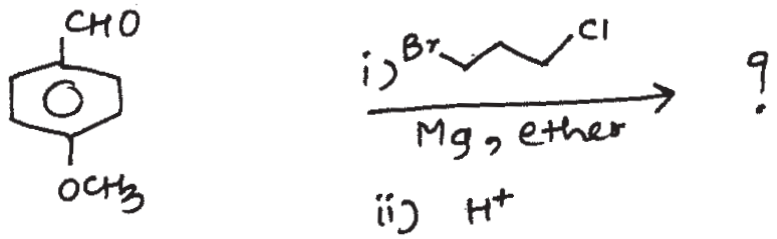
e) Reaction of benzaldehyde with  is much easier than reaction with  Explain.

P.T.O.

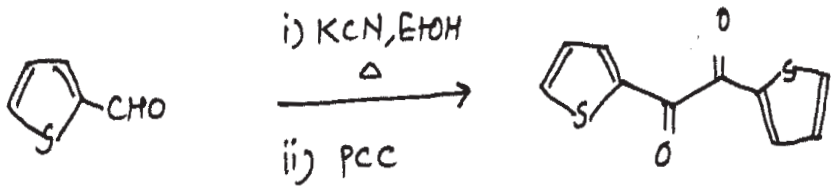
Q3) a) Predict the product (<u>any two</u>). **[4]**

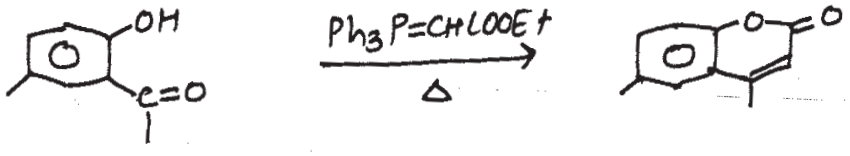
i) 

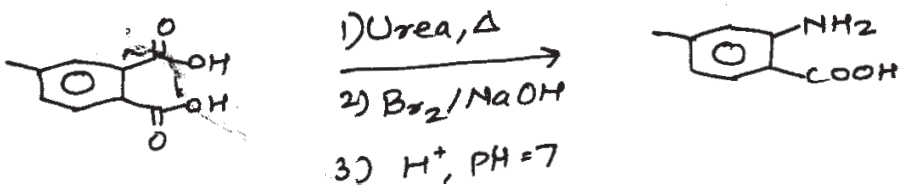
ii) 

iii) 

b) Suggest the mechanism (<u>any two</u>). **[4]**

i) 

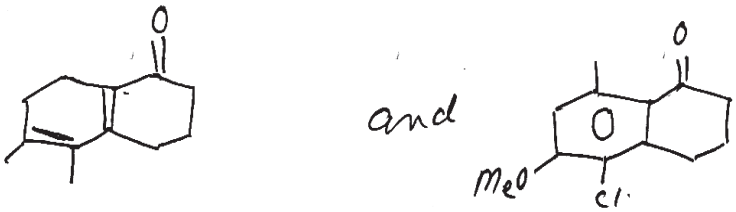
ii) 

iii) 

SECTION-II

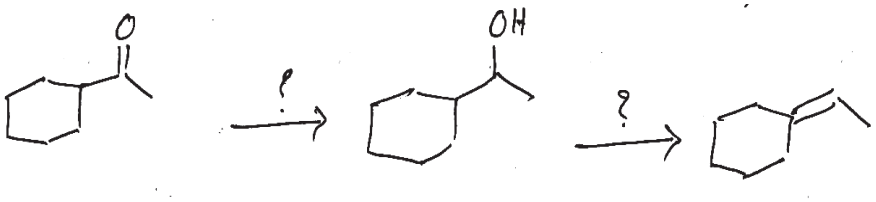
Q4) Attempt the following: **[10]**

a) Calculate the λ max for the following compounds.



b) Write a note on factors affecting chemical shift.

c) How will you monitor the following reaction sequence by IR. Suggest the reagents.



d) Explain with suitable example, the m^+ is stronger in alcohols and weak or absent in amines.

e) How will you distinguish the following compounds by PMR?

Q5) Deduce the structure of any five of the following compounds using spectral data and justify your answer, **[10]**

a) $C_6H_{10}O$

IR : 1710 and 1620 Cm^{-1}

PMR : δ 1.90 (*s*, 30 *mm*) δ 2.10 (*s*, 20 *mm*) δ 6.00 (*s*, 10 *mm*)

b) $C_6H_{10}O_3$

IR : 1740 and 1710 cm^{-1}

PMR : δ 1.28 (*t*, J = 7 Hz, 30 *mm*)

δ 2.21 (*s*, 30 *mm*)

δ 3.24 (*s*, 20 *mm*)

δ 4.20 (*q*, J = 7 Hz, 20 *mm*)

c) $C_8H_{15}NO$

I R : 1715 cm^{-1}

PMR : δ1.08 (*d*, J = 7 Hz, 6H)

δ 2.45 (*t*, J = 5 Hz, 4H)

δ 2.8 (*t*, J = 5 Hz, 4 H)

δ 2.93 (septet, J = 7Hz, 1 H)

d) $C_7H_7NO_3$

U. V. 265 mm

I R : 3600, 1520, 1360 cm^{-1}

PMR : δ 7.6 (*m*, 18 mm)

δ 8.15 (dd, J = 2 and 7Hz, 6 mm)

δ 2.9 (s, 6 mm, e×ch. D_2o)

δ 5 (s, 12 mm)

e) $C_7H_{12}O_4$

IR : 1742cm^{-1}

PMR : δ 2.6 (*s*, 10 mm)

δ 1.3 (*t*, J = 6.5 Hz, 30 mm)

δ 4.16 (*q*, J = 6.5 Hz, 20 mm)

f) Two isomeric compounds with molecular formula $C_{10}H_{12}O$ show following PMR data. Deduce their structures.

Isomer A : δ 1.0 (*t*, 3H), δ 2.45 (*q*, 2H),

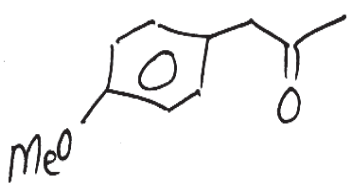
δ 3.7 (s, 3H), δ 7.25 (m, 4 H)

Isomer B : δ 2.1 (*s*, 3H), δ 2.75 (*t*, 2H)

δ 2.85 (*t*, 2H), δ 7.20 (5 H)

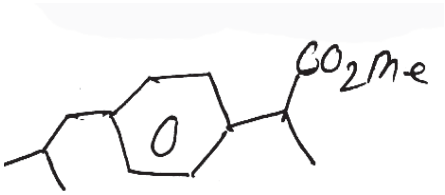
Q6) Attempt <u>any two</u> of the following. **[5]**

a) Assign the chemical shifts reasoning to the various carbon in the following compound.



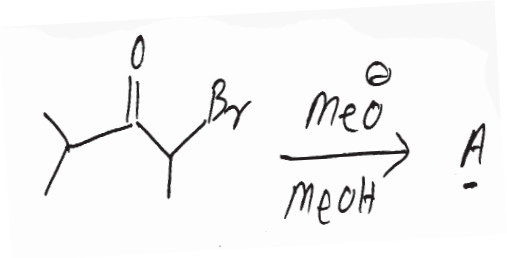
CMR : 29, (*q*), 50 (*t*), 55 (*q*)
114 (*d*), 126 (*s*), 130 (*d*)
150 (*s*), 207 (*s*)

b) Assign the chemical shifts for the following.



δ 0.9 (*d*, J = 7 Hz, 6H)
δ 1.5 (*d*, J = 7 Hz, 3 H)
δ 1.85 (*m*, 1H)
δ 2.45 (*d*, J = 7 Hz, 2H)

c) Suggest the structure for <u>A</u> .



PMR : δ 1.20 (9 H, S)
δ 3.67 (3 H, S)

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