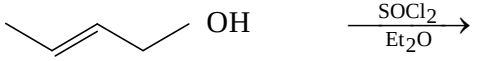
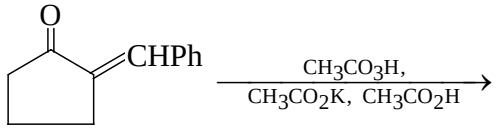
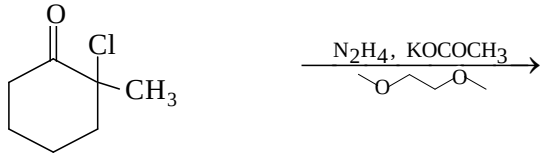
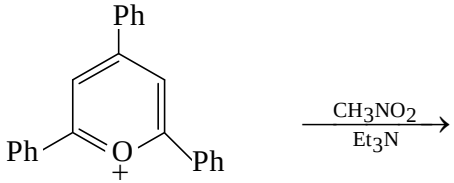
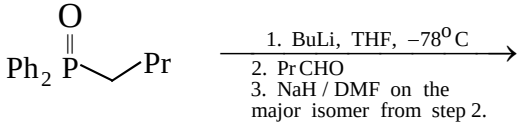
4. Predict the product/(s) with mechanism and showing major/ minor (if applicable) of the following reactions : 2×4

a) 

b) 

c) 

d) 

e) 

INTER B.SC. EXAMINATION, 2018

(1st Semester)

CHEMISTRY (HONOURS)

ORGANIC CHEMISTRY

PAPER - VI

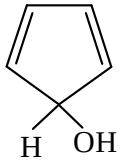
Time : Two hours Full Marks : 50

(25 marks for each group)

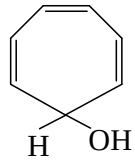
Use a separate answerscript for each group.

GROUP - A

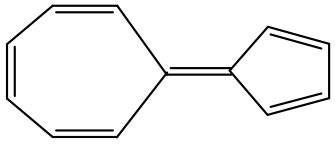
1. a) Comment on the relative reactivity of the following two alcohols with conc. H_2SO_4 under cold condition. Rationalise your answer. 2



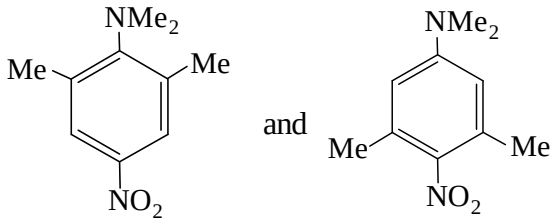
and



b) Opine on the polar characteristics of the following hydrocarbon and justify your answer. 2

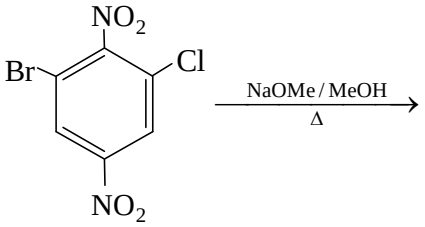


c) Compare the basicity of the following two isomeric amines and justify your answer. 2

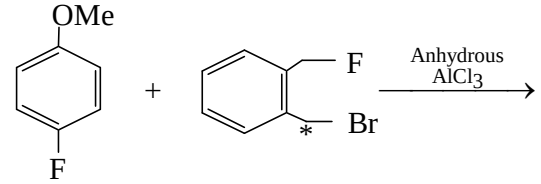


d) Predict the product in the following two reactions with brief explanation. 2×2

i)



ii)



(Major product with respect to isotopic carbon)

e) 'A styrene derivative undergoes fragmentation after coupling with an appropriate diazonium salt' – Mechanistically illustrate this with a suitable example. 3

c) Why an α,β-unsaturated ketone should not be epoxidised using a peracid ? What is the reagent of choice for epoxidation of such Michael acceptor ? Write the corresponding mechanism. $2\frac{1}{2}$

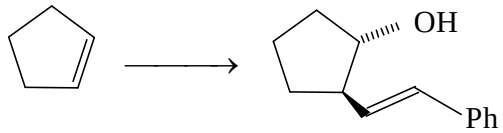
d) What happens when optically pure R -sec-butylmethyl ether is treated with HI under cold condition ? What will be the stereochemical outcome of one of the products ? Account for your answer. $2\frac{1}{2}$

3. a) Carry out the following conversions ***(any three)*** : $1\frac{1}{2}\times3$

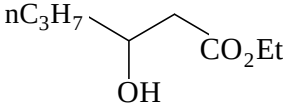
i) Diethyl malonate $\longrightarrow$ Succinic acid

ii) $n-C_3H_7CO_2H \longrightarrow n-C_3H_7CO\underset{OH}{CH}-nC_3H_7$

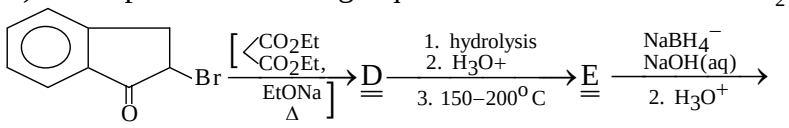
iii)



iv) $nC_3H_7CHO \longrightarrow$



b) Complete the following sequence of reactions : $2\frac{1}{2}$

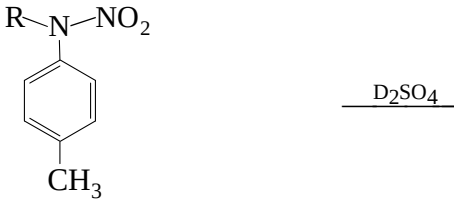


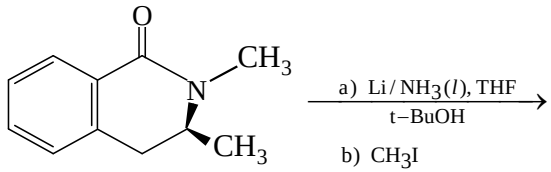
$\longrightarrow$ F (acid) + G (neutral)

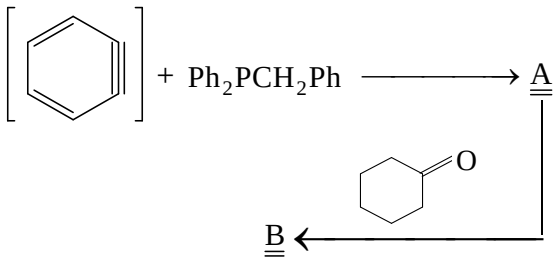
Write the structures of D - G showing relative stereochemistry at the asymmetric centres in F and G.

f) Mechanistically predict the product in the following reactions : ×2

i) 

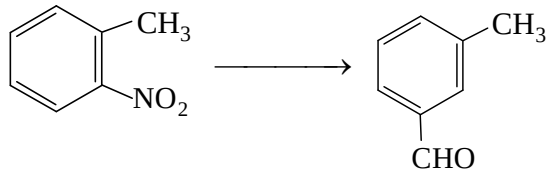
ii) 

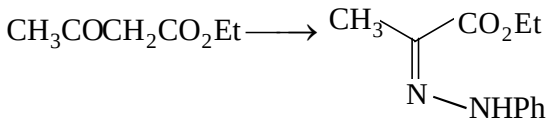
iii) 

iv) 

(Write only the structure of B and no mechanism is required for it)

g) How would you convert 2×2

i) 

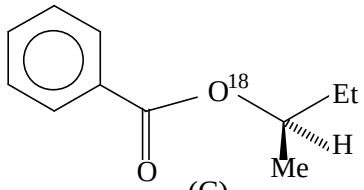
ii) 

GROUP - B

2. a) ''Benzaldehyde undergoes Benzoin condensation easily but p-nitrobenzaldehyde does not'' – account for the statement and depict the mechanistic pathway of the said condensation reaction. $2\frac{1}{2}$

b) i) With a suitable ester discuss with mechanism of its hydrolysis occuring via $B_{AL}2$ pathway. Cite one evidence in favour of this pathway. $1\frac{1}{2}$

ii) What products are obtained from the hydrolysis of ester (C) when it is refluxed using dil.sodium hydroxide ? (Comment on the ^{18}O distribution in the products and also on the stereochemical outcome of the alcohol). 1



(C)