

M. Sc. CHEMISTRY EXAMINATION, 2017

(4th Semester)

ORGANIC CHEMISTRY SPECIAL**PAPER - XIV-O**

Time : Two hours

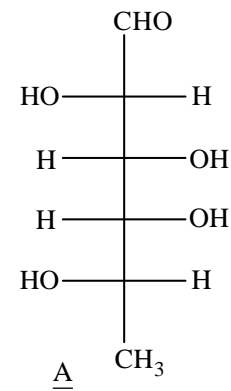
Full Marks : 50

(25 marks for each unit)

Use a separate answerscript for each unit.

UNIT - O - 4141

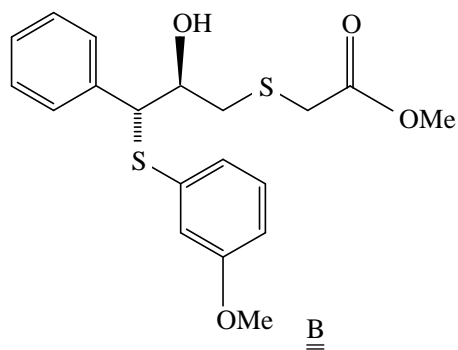
1. a) Suggest a scheme for the synthesis of the compound A starting from an easily accessible six carbon containing monosaccharide applying Chiron approach and give the synthetic steps involved in the proposed sequence. 4



- b) Discuss the synthesis of R, R-DIPAMP using *l*-menthol as the chiral auxiliary starting from a racemic phosphorous compound. (No mechanism or rationalization is needed)

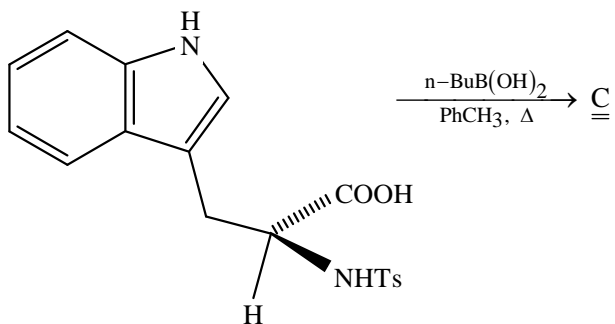
[2]

- c) Delineate the asymmetric synthesis of the following compound B utilizing Sharpless asymmetric epoxidation protocol in one of the steps (only mention the steps with reagents, no mechanism is needed). 3



- d) Predict the structures of C, D, E and F in the following sequences and rationalise the stereochemical aspects for the formation of D. 2+2

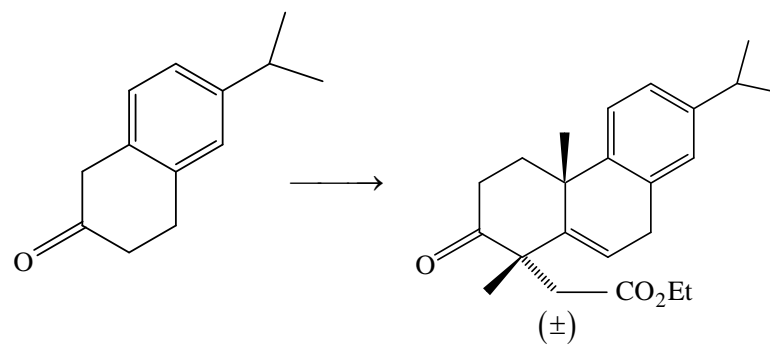
i)



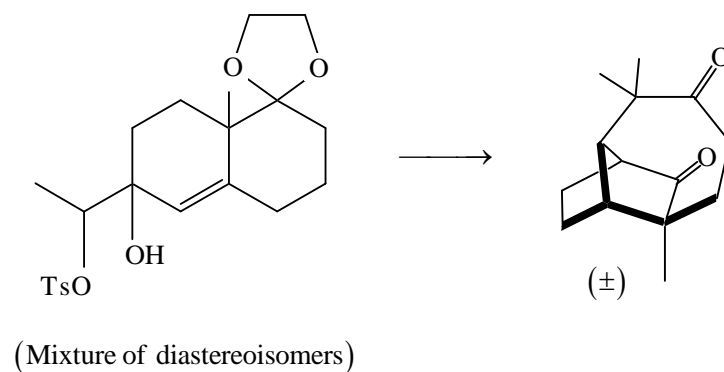
[7]

- c) Delineate the steps involved in the following conversion. Discuss plausible mechanistic and stereochemical interpretations, as necessary. 4+4

i)



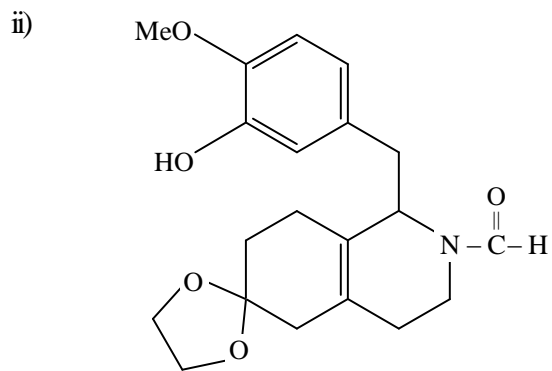
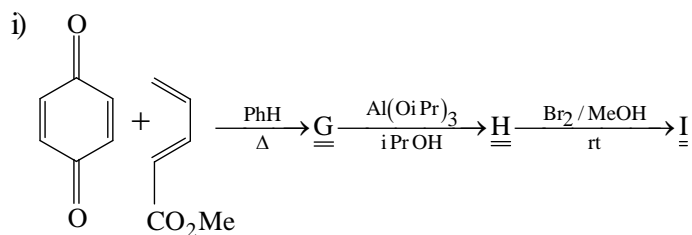
ii)



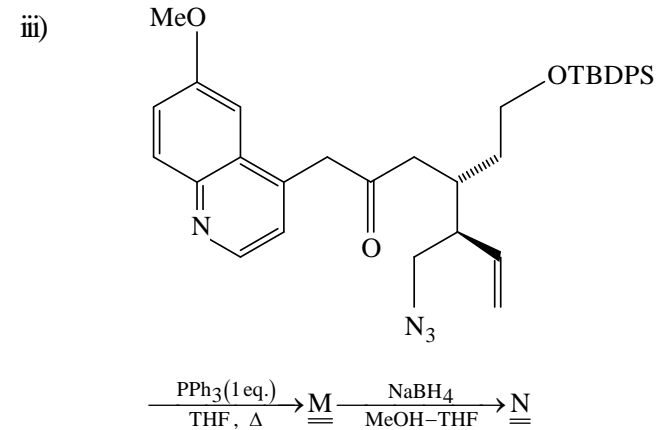
[4]

UNIT - O - 4142

2. a) Predict the products G, H, I, J, K, L, M and N of the following reactions. Suggest appropriate mechanistic and stereochemical interpretations, as necessary, for their formations. 4+3+3

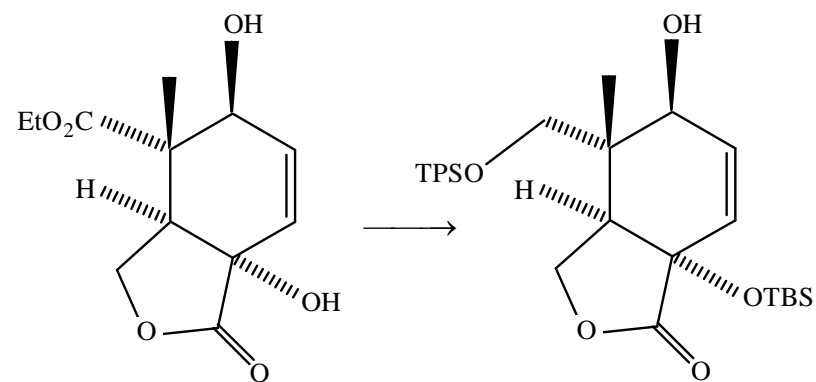


[5]



- b) Carry out the following transformations. Show all the intermediate products formed. (Mechanism is not required) 2+2+3

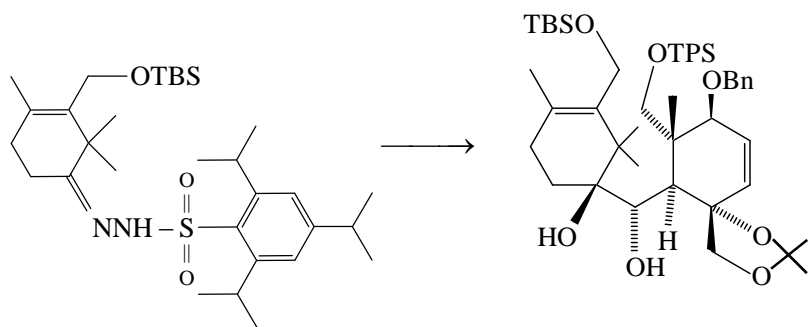
i)



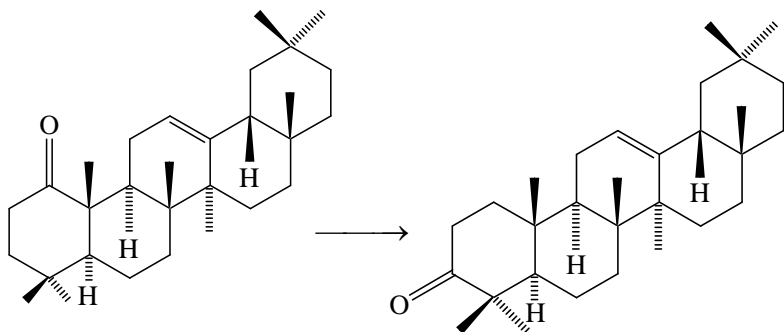
[Turn over

[6]

ii)

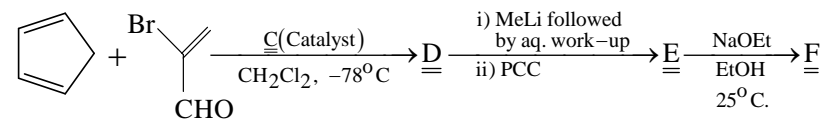


iii)



[3]

ii)



- e) Describe the asymmetric synthesis of L-Ornithine using a chiral phase transfer catalyst and account for the stereochemical outcome of this process. 4
- f) Draw the catalytic cycle and rationalize the stereochemical features of an asymmetric aldol reaction where a chiral ionic liquid acts as an organocatalyst. 3+2
- g) Discuss the role of a suitable double salt towards the outcome of solid state photocycloaddition of cinnamic acid. 2