

Total Page - 9

PG/2nd Sem/CEM/19

2019

M.Sc.

2nd Semester Examination

**CHEMISTRY**

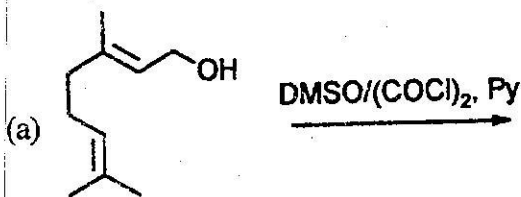
Paper - CEM 202

Full Marks : 40

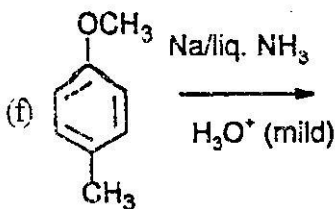
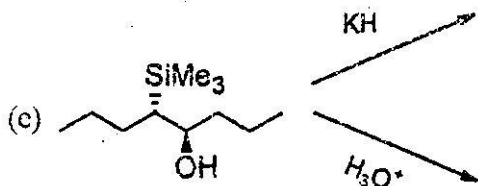
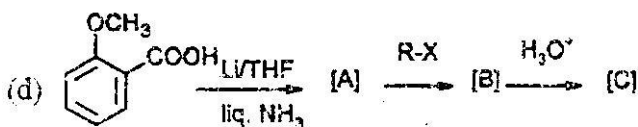
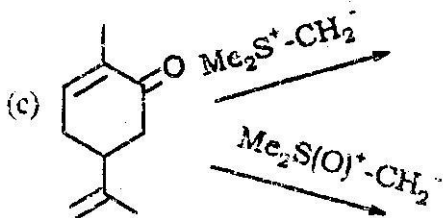
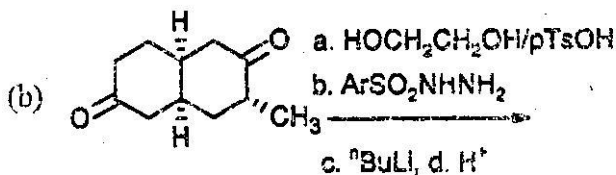
Time : 2 Hours

*The figures in the margin indicate full marks.  
Candidates are required to give their answers  
in their own words as far as practicable.*

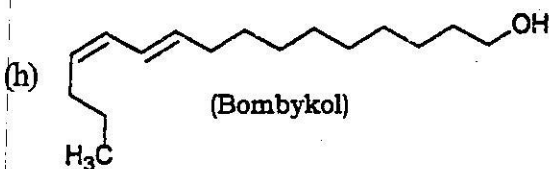
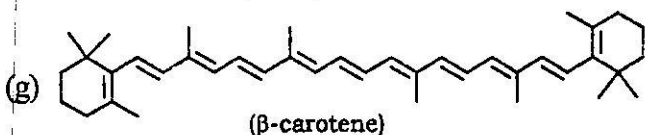
1. Answer any *four* questions from the following : 2×4



[ Turn Over ]



(g-h) Synthesize the following from easily available precursors :



2. Answer any *four* questions from the following :

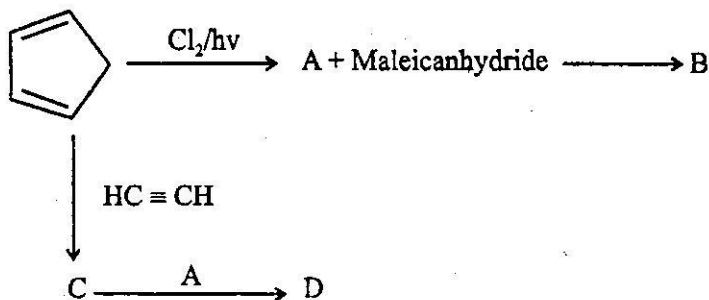
4×4

- (a) With the help of correlation diagram and PMO method justify the statement-“Diels-Alder reaction is as thermally allowed process”.
- (b) How will you synthesize the peptic ulcer drug ‘Tagamet’ ? Use retrosynthetic approach to start with simple available starting materials.

[ Turn Over ]

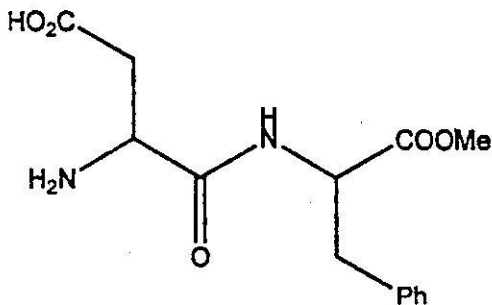
( 4 )

(c) Identify the products A, B, C and D and complete the following reaction sequence :



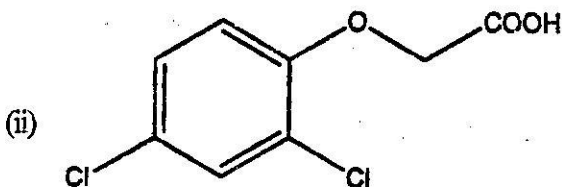
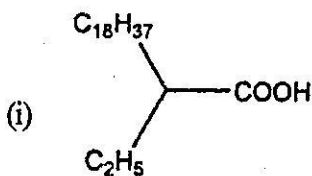
(d) Explain the term “Prochirality” with example of “pro R” and “Pro S” terminologies.

(e) Give the retrosynthetic approach as well as forward synthesis for the following compound :



( 5 )

- (f) Give the proper retrosynthetic analysis and forward synthesis of the following compounds :



- (g) What happens when benzocyclobutene and cycloheptatriene is heated with furan-2,5-dione separately.
- (h) Predict the products of the following reaction with mechanism : (1E, 4E)-1,5-diphenylpenta-1,4-dien-3-one is heated with Lewis acid.

3. Answer any *two* questions from the following :

8×2=16

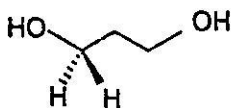
- (a) Explain the followings :

- (i) Draw Fisher projections for (2R, 3S)-2-bromo-3-chlorobutane and (2S, 3R)-2-bromo-3-chlorobutane.

[ Turn Over ]

(ii) Write the most stable conformation of  $(\text{Cl})_2\text{CH}-\text{CH}(\text{Cl})_2$  in Newman projections ? Draw the energy profile diagram with other conformers.

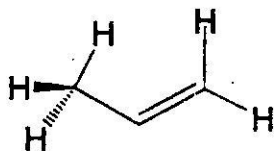
(iii) Assign Pro-R and Pro-S to the enantiotopic protons of the following compound.



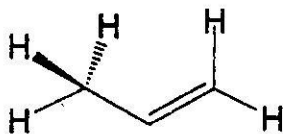
(iv) Write the most stable conformer of 2-isopropyl cyclohexanone with explanation.

2×4

(b) (i) How many asymmetric carbon atoms are created during the complete reduction of benzil ( $\text{PhCOCOPh}$ ) with  $\text{LiAlH}_4$  ? Also write the number of possible stereoisomers of the product.



Ecllpsed



bisected

(ii) Which one is more stable conformer of the above two and why ?

( 7 )

(iii) Write in brief with one example in each case :

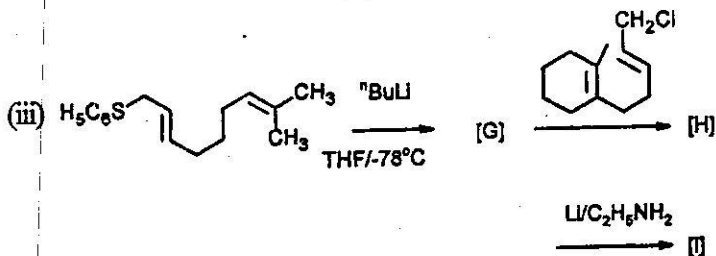
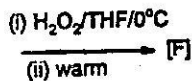
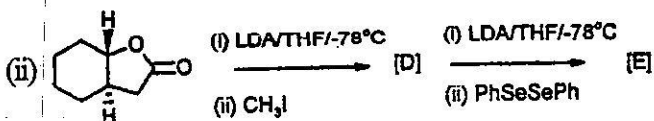
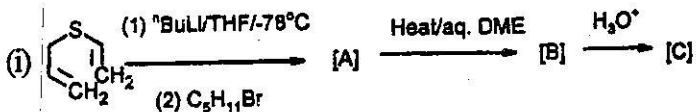
(a) Aryl groups involvement in neighbouring group participation.

(b) Sharpless allylic epoxidation reaction.

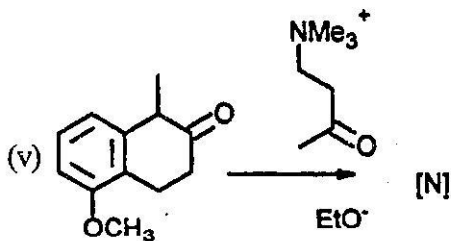
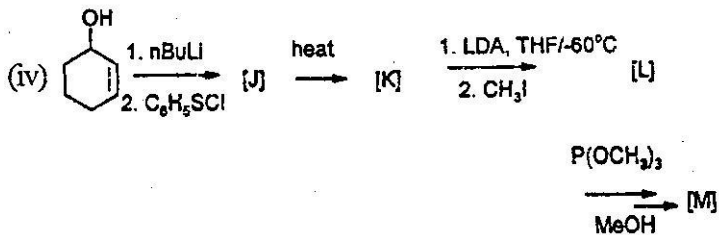
2+2+4

(c) Answer any *four* questions from the following :

2×4



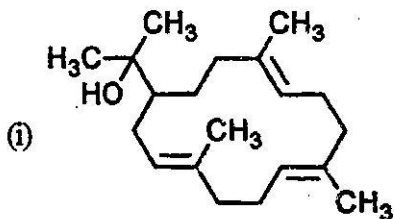
[ Turn Over ]



(d) Synthesize the following from suitable starting materials.

[one question from (i), (ii) and one question from (iii), (iv)]

3+5





( 9 )

