2017

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.

Illustrate the answers wherever necessary.

(*Organic*)

Answer any *five* questions,
taking at least *two* from each group.

Group—A

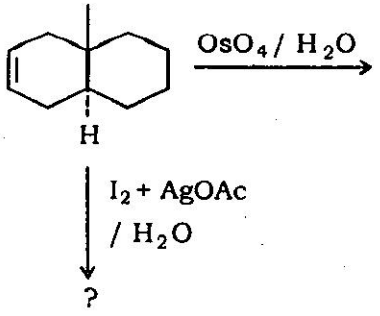
1. (a) How many chiral centers are there in 9,10-dimethyl decalins ? Write 3D structures of those conformers and show in them the *gauche-butane* interactions. 4

(b) Draw the 3D structures for the following conformers and show in them different steric interactions and comment on their chiralities.

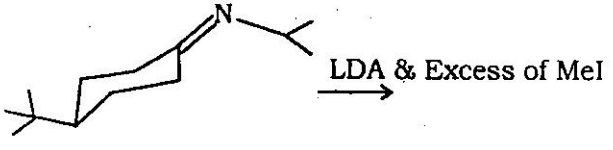
(i) cis-transoid-cis perhydroanthracene.

(ii) trans-cisoid-cis perhydrophenanthrene. 4

2. (a) Predict the product(s) with plausible mechanism : 4



(b) Predict the product(s) with appropriate reasoning : 4



3. Write in brief giving one example only of the following :

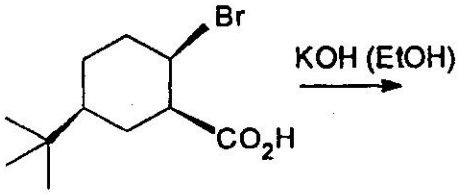
(a) Prochirality.

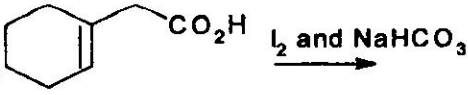
(b) Felkin Model.

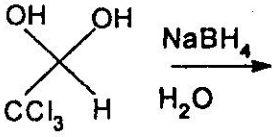
(c) 2-alkyl Ketone Effect.

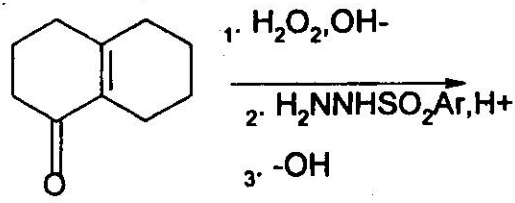
(d) 3-alkyl Ketone Effect. 8

4. Predict the product(s) with stereochemistry and mechanism :

(a) 

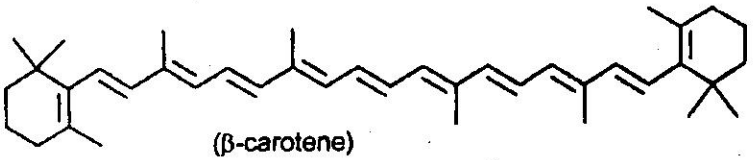
(b) 

(c) 

(d) 

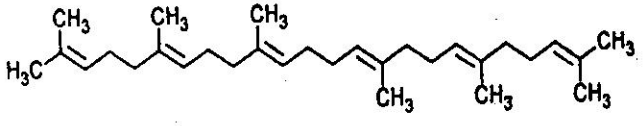
5. Synthesize the following from easily available starting materials (one question from i, ii and one question from iii, iv) 3+5

(i)



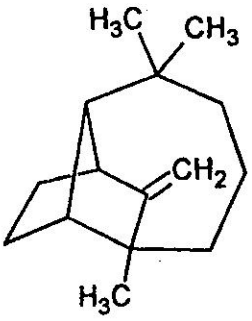
(β-carotene)

(ii)



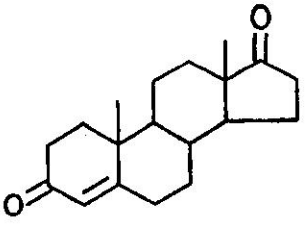
(Squalene)

(iii)



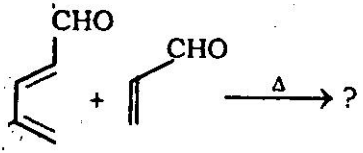
(Longifolene)

(iv)



Group—B

6. (a) Explain "Diels-Alder reaction of reverse electron-demand" showing energy value of the following reaction indicating the product ;

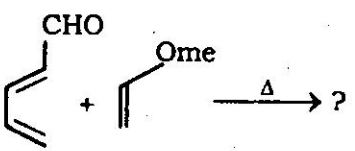


(b) Define "periselectivity". Explain with reason why the following reaction gives (4+6) instead of (2+4) or other adducts ;

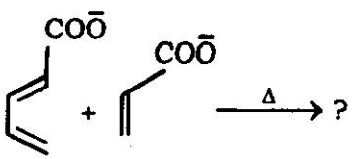
4+4

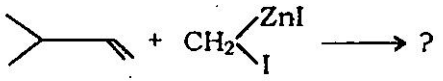
7. Define "regioselectivity". Hence predict the products of the following reactions.

(a)

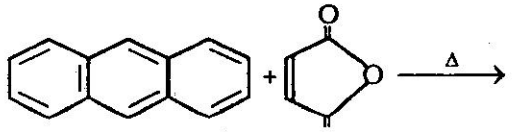


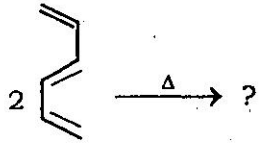
(b)



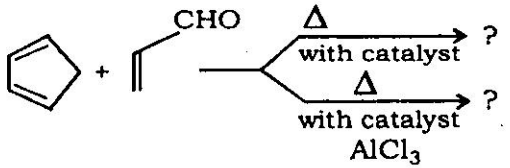
(c)  2+3×2

8. (a) What is site selectivity ? Predict the product of the following reaction with explanation :

(i) 

(ii) 

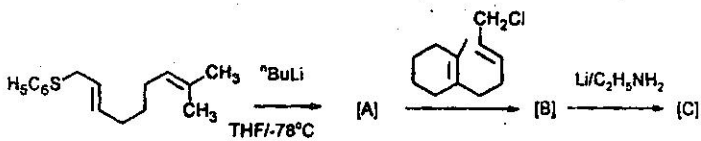
(b) What is Secondary interaction ? Predict the product of the reaction :



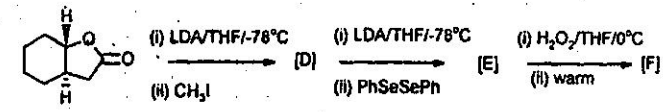
4+4

9. Predict the product(s) (*any four, with plausible mechanism*) :

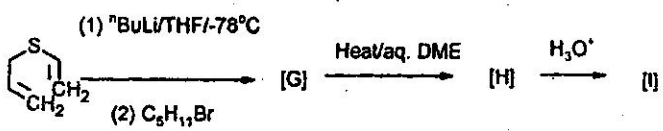
(a)



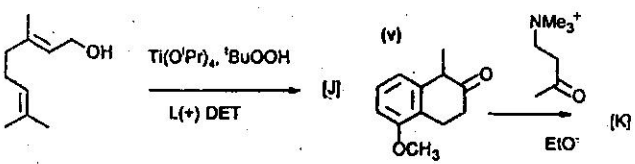
(b)



(c)

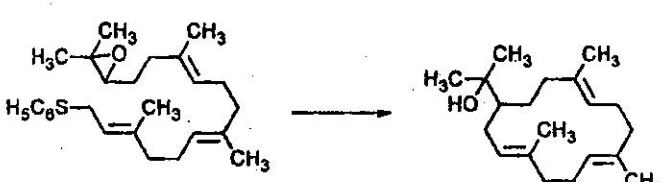


(d)



10. Carry out the following transformation (*any four*) :

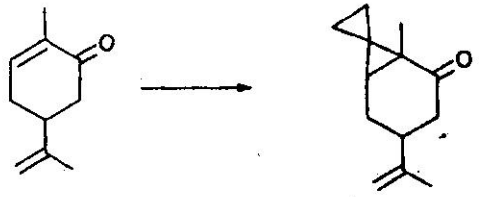
(a)

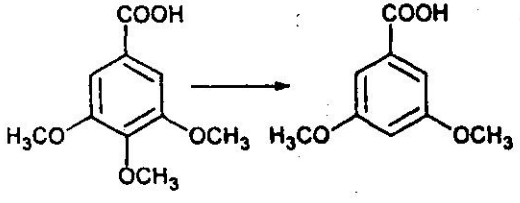


(b)

(c) 
H2C
OSiMe3
Li
R
O
H

(d) 
H
O
O
H
H
O
H

(e) 
O
O

(f) 
COOH
H3CO
OCH3
OCH3
COOH
H3CO
OCH3