

P.G. Semester-IV Examination, 2023

CHEMISTRY

Course ID : 41452

Course Code : CHEM-402E

Course Title : Organic Chemistry Special

Time : 2 Hours

Full Marks : 40

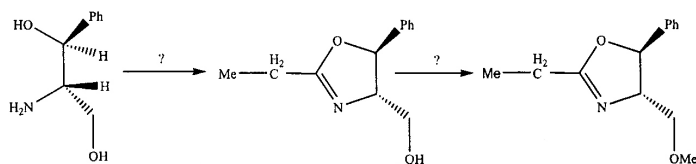
The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

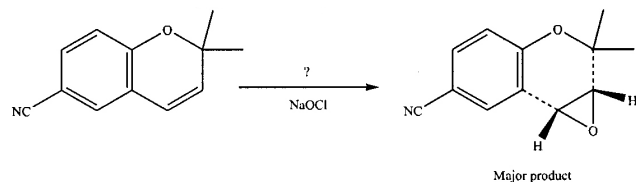
1. Answer any **five** of the following questions:

2×5=10

a) Identify the missing reagents in the following reaction sequence:

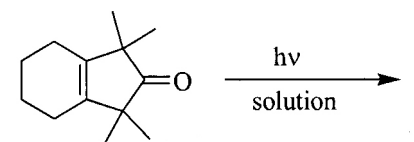


b) Draw the structure of the missing reagent in the following reaction:



[Turn over]

- c) Write down the structure of a catecholate siderophores.
- d) 'The Norrish Type I process is mostly favoured by photolysis in the vapour phase and is less pronounced in the inert solvents'- Explain.
- e) Predict the product in the following reaction:

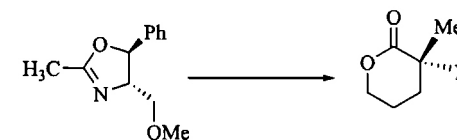


- f) Why lower oxidation state of chromium Cr(III) is used during oxidation?
- g) Write the adverse effect of Collin's reagent with example.

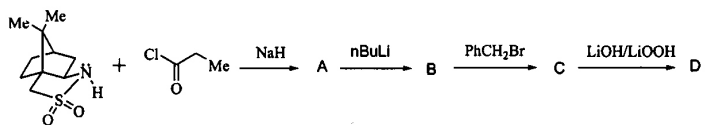
2. Answer any **four** of the following questions:

5×4=20

a) i) Carry out the following transformation:

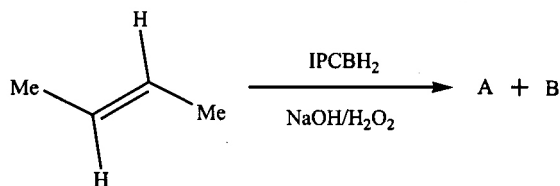


ii) Predict the products A to C in the following reaction sequence:



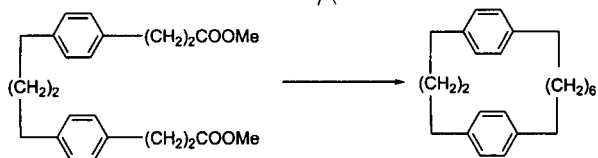
3+2=5

- b) i) Write down the products formed in the following reaction and justify your answer:



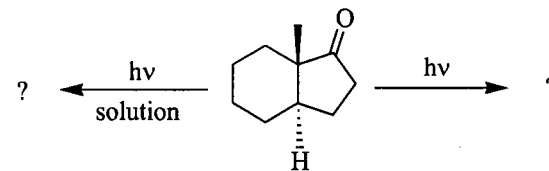
- ii) Mention one limitation of IPC_2BH_2 (Diisopinocampheylborane) in asymmetric hydroboration of an olefin. 4+1=5

- c) i) What do you mean by anticrowns? Give one example.
 ii) Carry out the following transformation and show the mechanism involved:

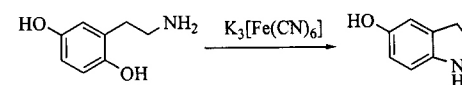


2+3=5

- d) Predict the products formed in the following sequence of reactions with viable mechanism. 5

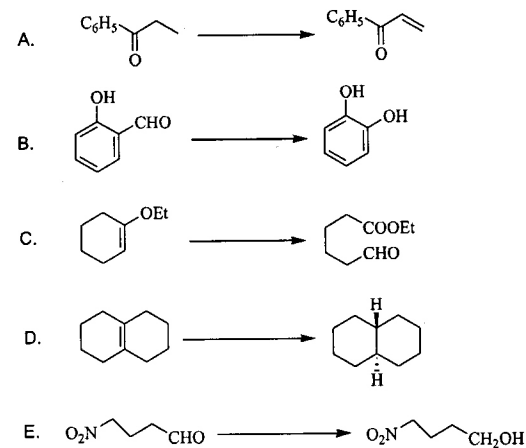


- e) i) Write a short note on Paterno-Buchi reaction.
 ii) Rationalize the reaction:



3+2=5

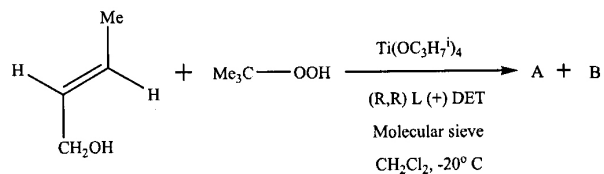
- f) How would you carry out the following transformations? 5



3. Answer any **one** of the following questions:

10×1=10

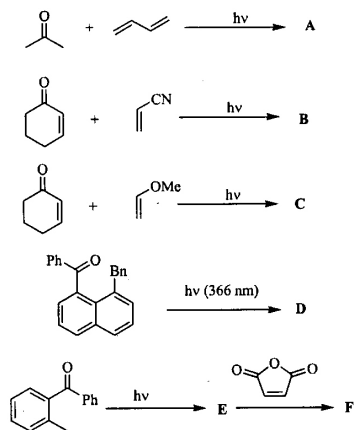
- a) i) Predict the major products in the following reaction with suitable mechanism. Explain the selectivity, if any, involved.



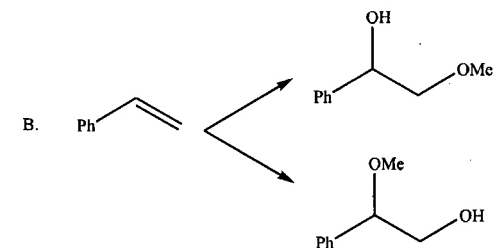
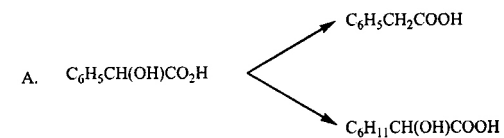
- ii) Why molecular sieve is used in Sharpless asymmetric epoxidation (SAE) reaction?
 iii) Explain with suitable example the 'template effect' in the synthesis of macrocyclic compound.

5+1+4=10

- b) i) Identify the products formed in each of the following reactions:



- ii) Write the appropriate reagent(s) for the following transformations:



6+4=10
