

## P.G. Semester-II Examination, 2023

### CHEMISTRY

Course ID : 21452

Course Code : CHEM202C

Course Title : Organic Chemistry

Time : 2 Hours

Full Marks : 40

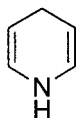
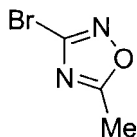
*The figures in the right-hand margin indicate marks.*

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

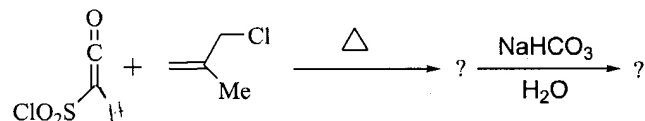
1. Answer any **five** of the following questions :

2×5=10

- a) Write the names of the following compounds according to Hantzsch-Widman rules:

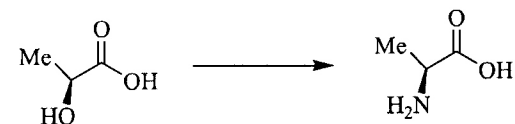


- b) Identify the missing products in the following reaction sequence:

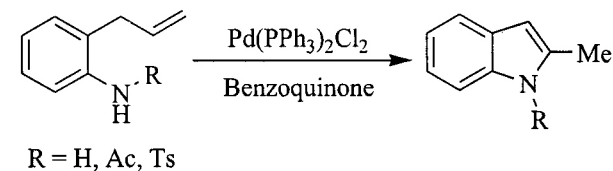


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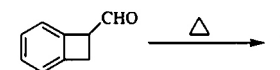
- c) Carry out the following transformation:



- d) Write down the structures of IBX and Dess-Martin reagent.
- e) Provide a plausible mechanism of the following transformation:



- f) Explain the term 'secondary orbital interaction' relevant to Diels-Alder reaction with suitable example.
- g) Identify the final product in the following reaction:

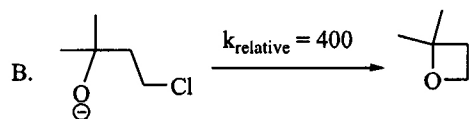
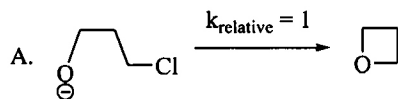


2. Answer any **four** of the following questions:

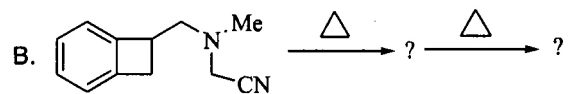
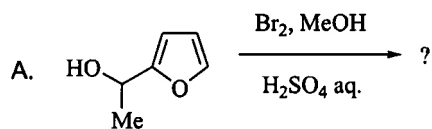
5×4=20

- a) i) What do you mean by Umpolung reaction? Give one suitable example.

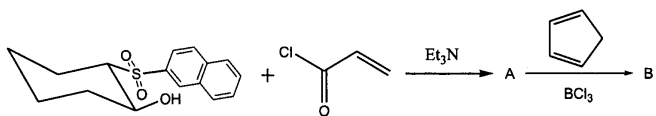
- ii) Relative rate of the reaction B is higher than that of reaction A.– Explain. 3+2=5



- b) Predict the products in each of the following reactions with suitable mechanism: 4+1=5



- c) i) Why asymmetric synthesis is important in our daily life?  
 ii) Write down the stereochemistry of the major products formed in the following reactions. Explain the selectivity, if any, involved. 2+3=5



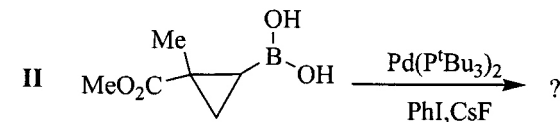
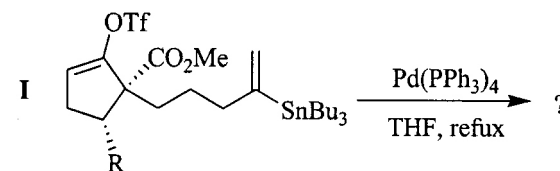
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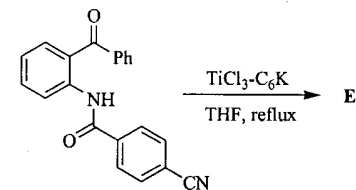
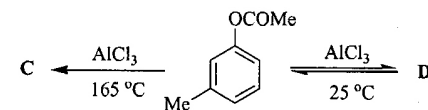
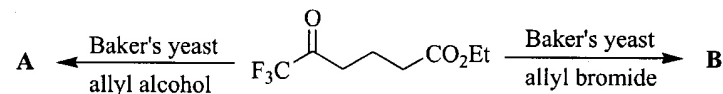
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- d) i) "Peterson elimination reactions are anti under acidic conditions and syn under basic conditions"– explain with suitable examples.

- ii) Identify the missing products formed in the following reaction sequence: 3+2=5



- e) Predict the products A to E formed in the following sequence of reactions: 5



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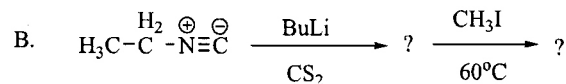
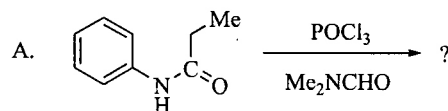
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- f) i) How can you synthesize cubane from the dimer of cyclopenta-2,4-diene-1-one?
- ii) Give an example to show exclusive occurrence of boat like transition state in Cope-rearrangement.  $3+2=5$

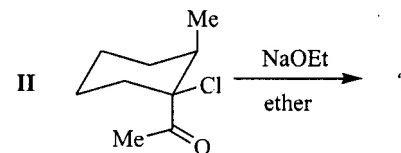
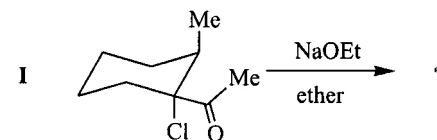
3. Answer any **one** of the following questions:

$$10 \times 1 = 10$$

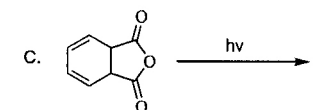
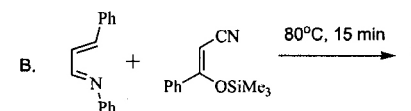
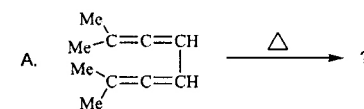
- a) i) Give an example of asymmetric Diels Alder reaction catalysed by chiral Lewis acid and explain the course of reaction.
- ii) Predict the missing products in the following reaction sequences with plausible mechanism:  $4+(4+2)=10$



- b) i) Identify the products formed in each of the following reactions and provide the plausible mechanism.



- ii) Predict the product(s) formed in each of the following reactions with suitable mechanism:  $4+6=10$



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