

**M. Sc. CHEMISTRY EXAMINATION, 2017**

( 3rd Semester )

**ORGANIC CHEMISTRY SPECIAL****PAPER - XII-O**

Time : Two hours

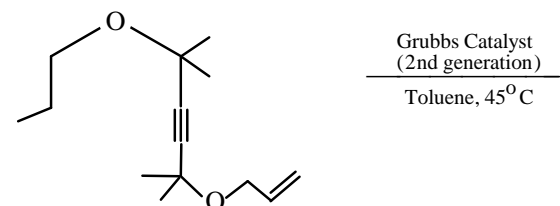
Full Marks : 50

( 25 marks for each unit )

Use a separate answerscript for each unit.

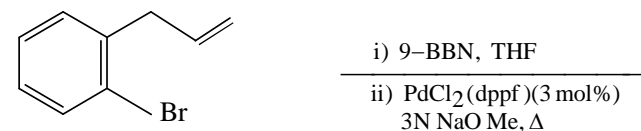
**UNIT - O-3121**Attempt *all* the questions .

1. a) Predict the product(s) of the following reaction and explain with mechanism. 1+2+1



How can you prepare the above substrate ?

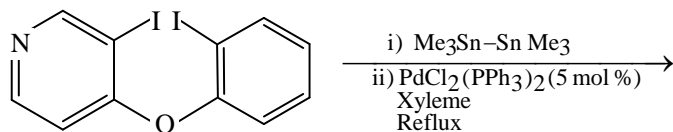
- b) Predict the product(s) and explain the mechanism of formation. 3



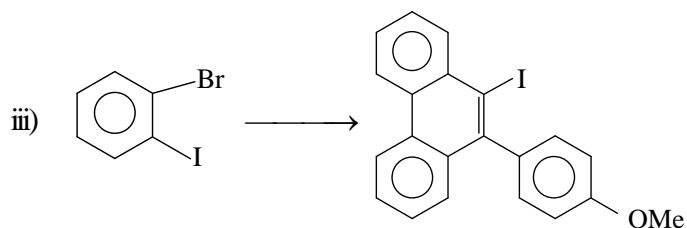
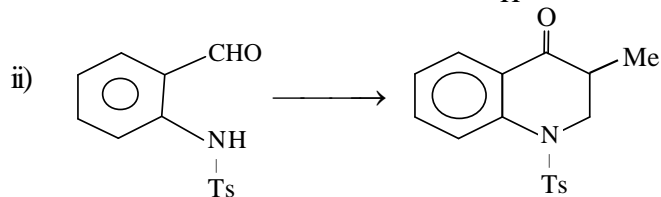
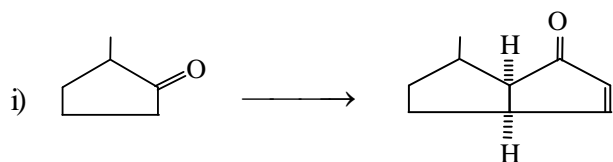
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[ 2 ]

- c) Predict the product(s) and draw the mechanism of the reaction. 3



2. a) How can you carry out following transformations ?  
(Mechanism not required)  $2 \frac{1}{2} + 2 \frac{1}{2} + 2 \frac{1}{2}$

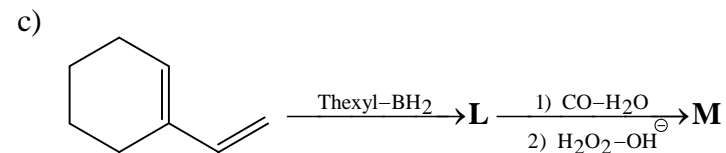
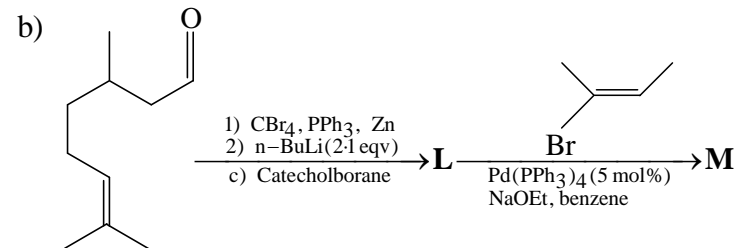
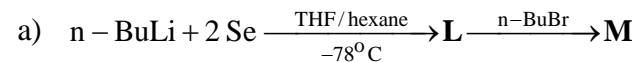


- b) Identify the products **A** and **B** in the following reaction sequence and indicate the name of the reactions happening. Explain the mechanism involved in each step.

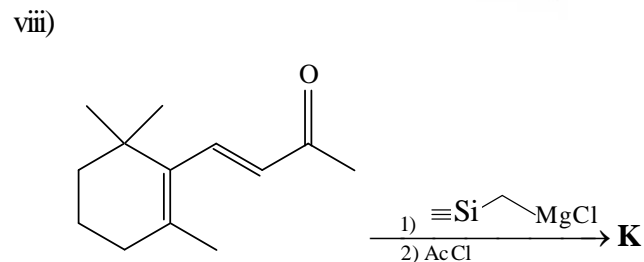
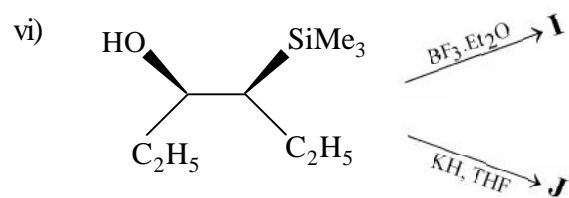
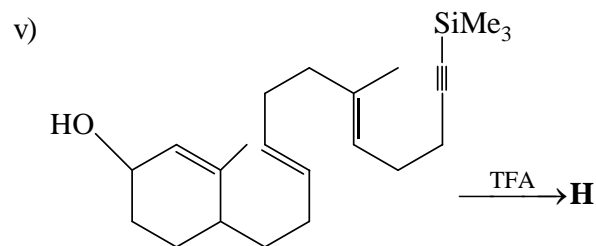
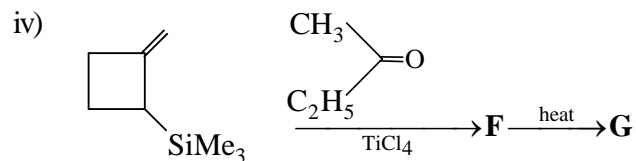
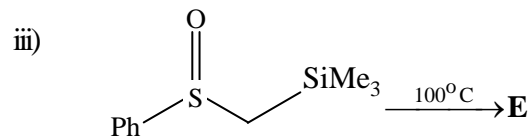
1+1+4

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6. Identify and in the following scheme (*any one*) 1



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4. Answer **any one** of the following questions :  $2\frac{1}{2}$

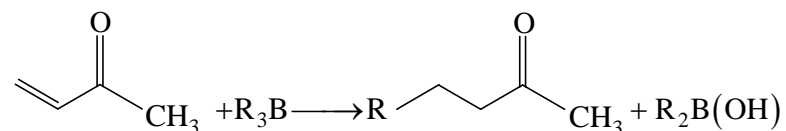
a) Discuss the differences between Fischer and Schrock type carbenes with respect to the nature of metals and ligands.

b) Draw MO diagram for Fischer carbenes and Schrock carbenes. Indicate HOMO and LUMO.

5. Answer **any two** of the following questions :  $2 \times 2$

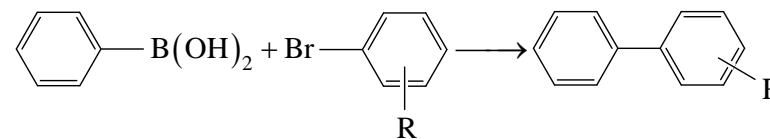
a) Fischer carbene behaves as compounds with ester type functionality - explain.

b) Discuss the mechanism of the following reactions indicating reaction condition.



c) Discuss the reaction condition and mechanism of synthesising *E* and *Z*-alkenes by organoboron chemistry.

d) Carry out the following reaction

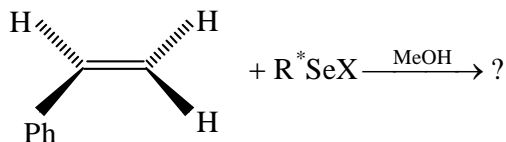


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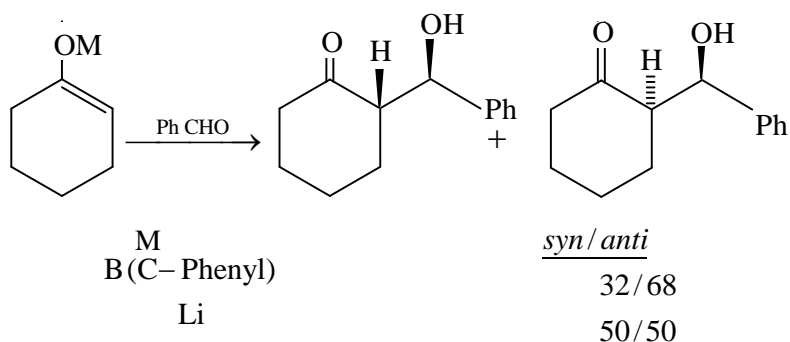
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6. Answer **any two** of the following questions :  $2 \times 2 \frac{1}{2}$ 

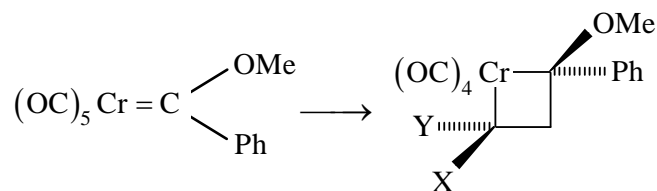
a) Predict the product(s) and stereoselectivity of the following reaction.



b) Justify with proper reasons the following observation.

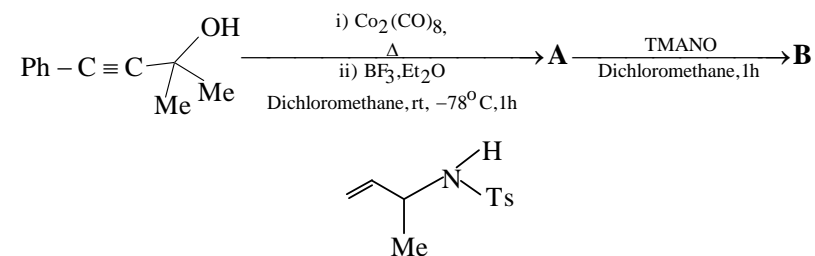


c) Perform the following reaction with necessary reagent, condition and mechanism.



d) Explain the methodology of cyclopropanation using Fischer carbenes.

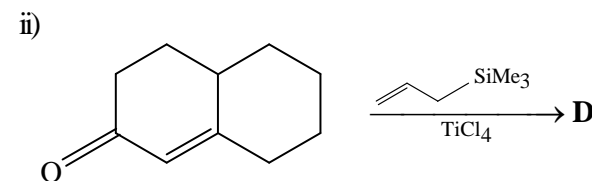
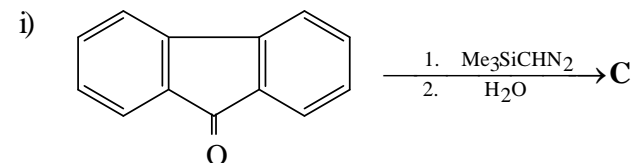
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c) Describe the role of base in Suzuki coupling reaction.

 $1 \frac{1}{2}$ **UNIT - O-3122**

3. a) Write a method for the preparation of trimethylsilyl diazomethane. Why is it superior to diazomethane ?

 $2 + \frac{1}{2}$ b) Predict the product(s) of the following reactions with plausible mechanism, where applicable. (**any five**)  $2 \times 5$ 

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