

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1837

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Unique Paper Code : 2173012011

Name of the Paper : DSE: Reactions, Reagents and Chemical Processes

Name of the Course : **B.Sc. (Hons) Chemistry**

Semester : IV

Duration : 3 Hours

Maximum Marks : 90

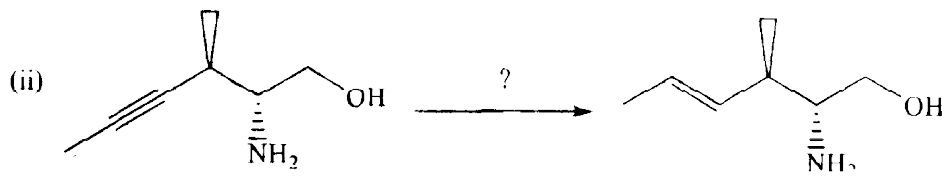
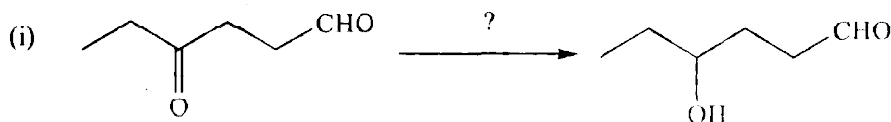
Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **six** questions.
3. **All** parts of a question should be attempted together.
4. Each question carries **15** marks.

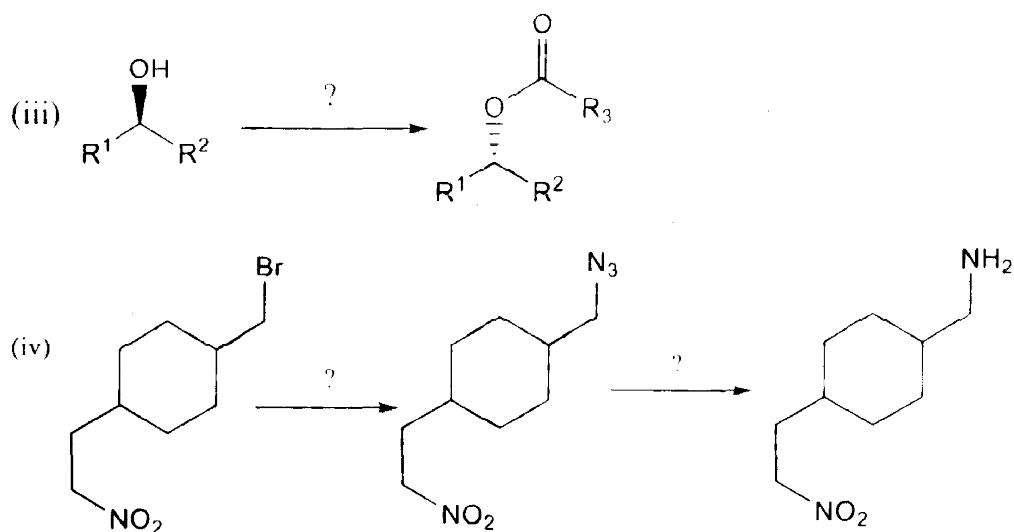
1. Explain **any three** of the following reactions with suitable mechanisms :

- (a) Suzuki Coupling Reaction
- (b) Mukaiyama Aldol Reaction
- (c) 1,3-dipolar cycloaddition Reaction
- (d) Mitsunobu Reaction (5,5,5)

2. (a) Identify the most suitable reagents required to accomplish the following chemical transformation (**any three**) : (3×2)



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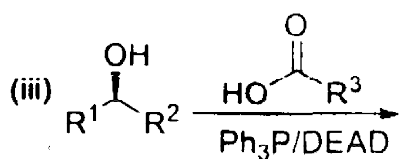
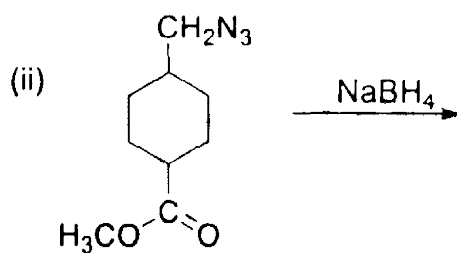
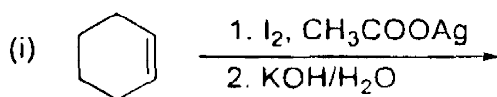
(b) Give the chemical structures of the following reagents and provide one application of each using a suitable reaction :

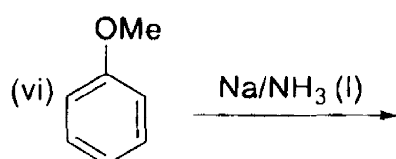
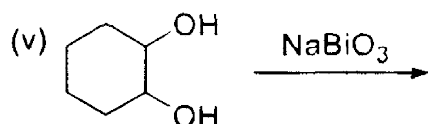
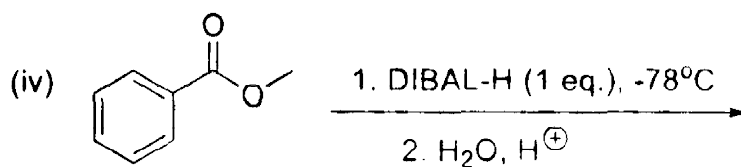
(i) Catecholborane

(ii) Red-Al

(iii) Schwartz Reagent (3×3)

3. (a) Complete the following reaction by giving the suitable product. (6×2)





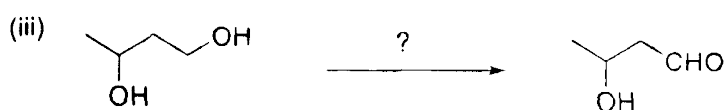
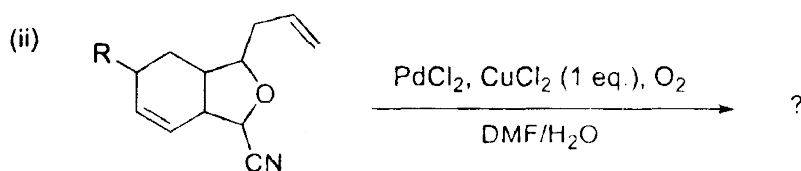
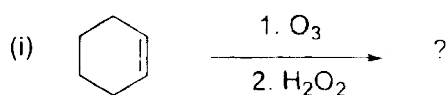
(b) What is the Julia-Olification Reaction? Explain with a suitable example. (3)

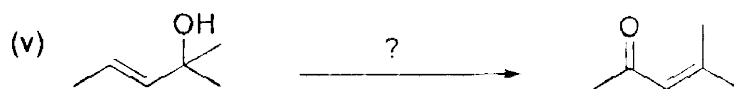
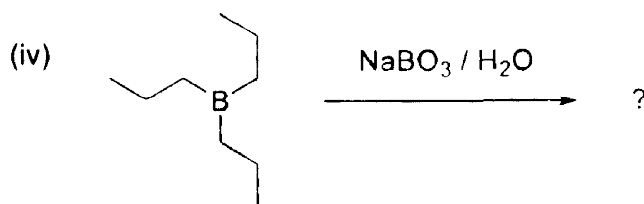
4. (a) What is the Heck coupling reaction? Write the steps involved in the mechanism of the Heck Coupling reaction.

(b) Write the reaction and mechanism of the Wittig Reaction?

(c) Discuss the Bischler-Napieralski Reaction with mechanism? (5,5,5)

5. (a) Complete the following transformations by giving the correct reagent/major product : (5×2)





(b) Write the chemical structure of the following reagents :

(i) TEMPO

(ii) DEAP

(iii) DIBAL-H

(iv) Dess-Martin reagent

(v) LDA

(5×1)

6. Explain the following with suitable mechanisms :

(a) Wacker oxidation

(b) TPAP oxidation

(c) Fetizon's oxidation

(5,5,5)

7. Write short notes on the following :

(a) Scale-up of an API

(b) Non-metallic oxidizing agents for oxidation process

(c) Halogenation reactions and its type.

(5,5,5)

8. (a) Define in-process control (IPC) and discuss its importance in ensuring quality in large-scale production.

(b) Discuss nitration process and its industrial applications.

(c) Describe the Swern oxidation? Discuss its advantages over other oxidation methods like Jones oxidation.

(5,5,5)