

**Ph.D. IN CHEMISTRY
(PHDCHEM)**

Term-End Examination

December, 2022

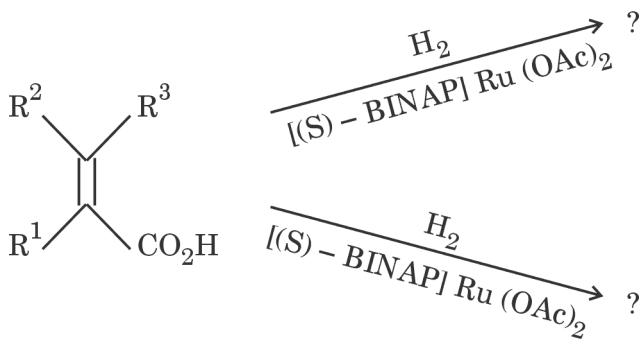
**RCHE-001 : ADVANCES IN ORGANIC
CHEMISTRY**

Time : 3 hours

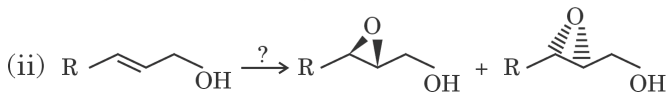
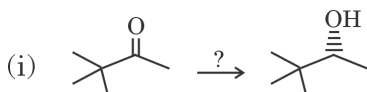
Maximum Marks : 100

Note : Answer **all** the questions given below.

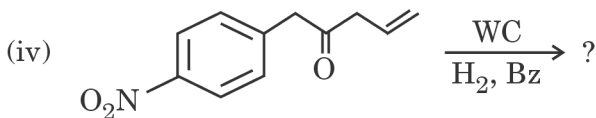
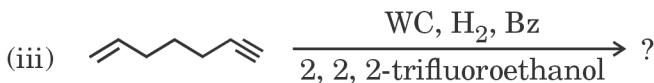
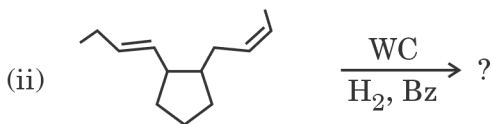
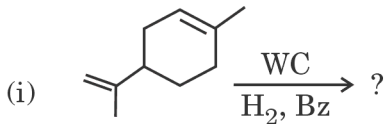
1. Complete the following reaction and write its mechanism. Explain giving reasons. 10



2. Write the reagents used for the following reactions. Give reason for choosing the reagent. 10



3. Write the formula of Wilkinson's Catalyst (WC). Complete the following reactions taking place in presence of this catalyst. Give reason for your answer. 10

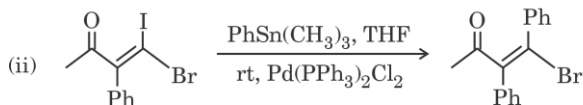
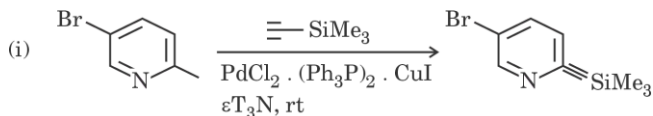


4. What is MORE chemistry ? What is the other name given to it and why ? Give its advantages citing two examples from organic synthesis. 10

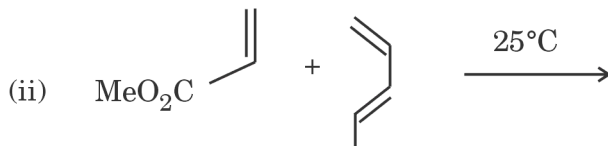
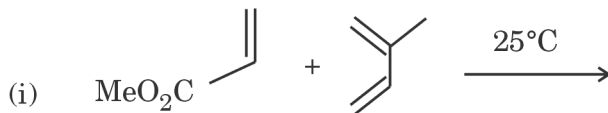
5. (a) What is meant by atom economy in green chemistry ? Explain giving a suitable example. 5

(b) Write the principle involved in sonochemistry. Give its application in organic synthetic chemistry. 5

6. Name and write the mechanism of any **one** of the following reactions : 10



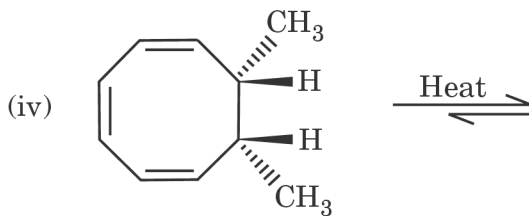
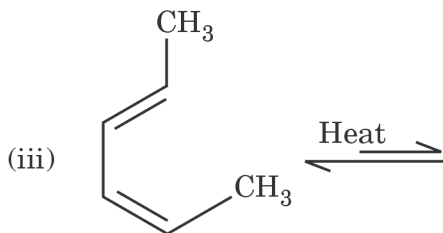
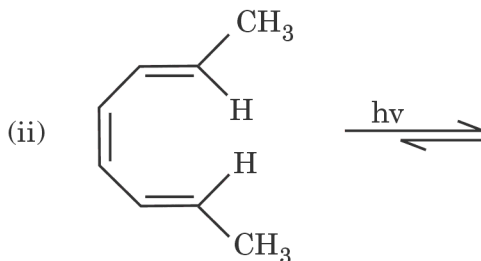
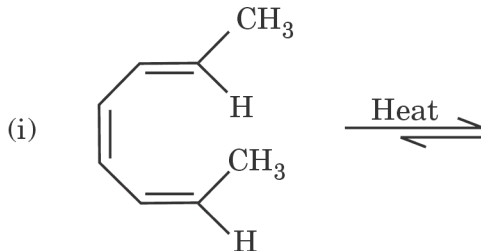
7. Predict the products and explain the regiochemistry of the following reactions : 10

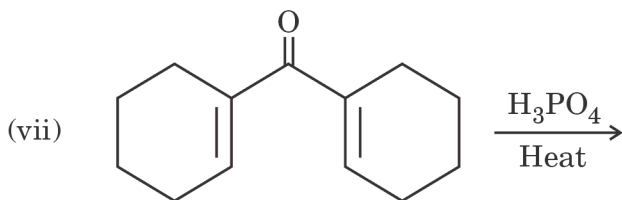
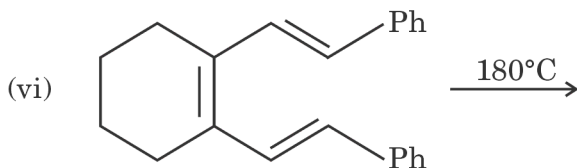
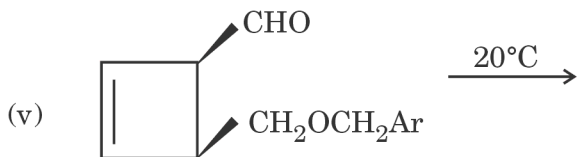


Why does the addition of AlCl_3 improve the rate and regioselectivity of these reactions ?

8. Write the structure including the type of rotation involved and the stereochemistry of the products expected in the following reactions :
(Attempt any **five**)

10





9. Construct the MO diagram to show that the thermal-induced Diels-Alder reaction is allowed, and photo-induced is forbidden. 10

10. (a) List various binding forces that are present in supramolecules. Discuss these with suitable examples. 5

(b) Write the applications of supramolecular chemistry. 5