# M.Sc. Examination 2017

**Semester-IV**

**Chemistry**

**Course: CH-1020**

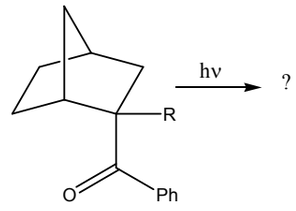
**( Optional : Organic Chemistry )**

**Time: Three Hours** **Full Marks: 40**

Questions are of equal value or as indicated in the margin.

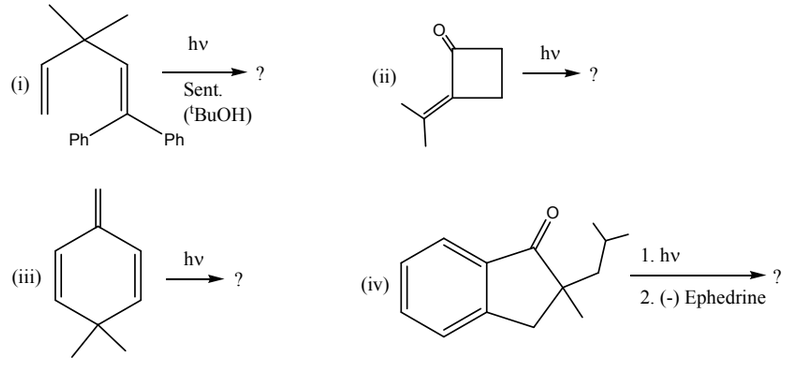
Answer ***any two*** questions from ***Question No. 1-3*** and another ***two*** questions from ***Question No. 3-6.***

1. a) The compound given below follows two different photochemical reaction pathways for R=$CH_3$ and R=H. Predict the structure of the major product in each case and justify your answer. 4

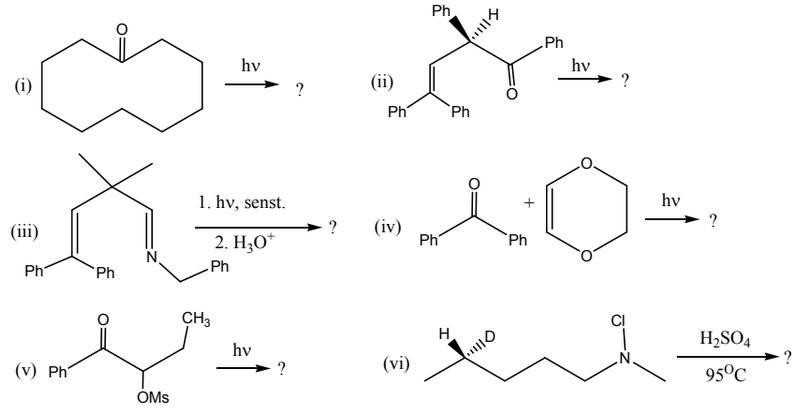



R = $CH_3$ /H

b) Predict the structure of the product(s) with appropriate stereochemistry (if applicable) and give mechanism in each case: 4x1.5



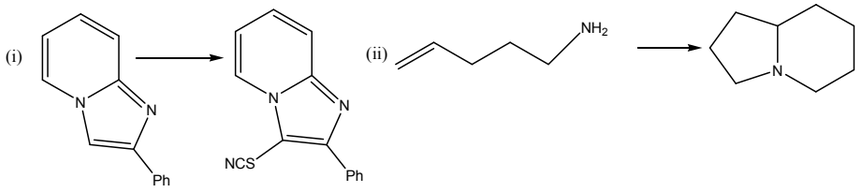

2. a) Predict the product(s) with appropriate stereochemistry and identify the major product (if applicable). Justify. 6x1.5



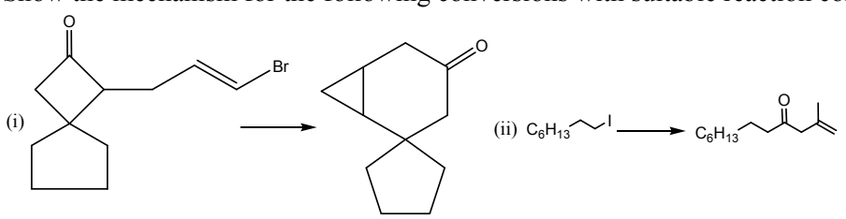

**P.T.O.**

b) Give two examples of commercially available stable free radicals. 1

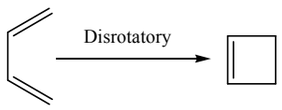
3. a) Do the following transformation mentioning the reaction intermediates. 3x2



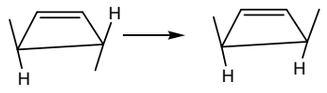

b) Show the mechanism for the following conversions with suitable reaction conditions. 2x2



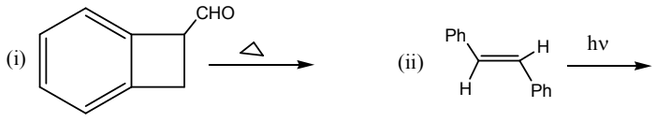

4. a) Construct a correlation diagram for the following transformation and explain the favourable reaction conditions (hγ or Δ). 4




b) How would you carry out the following conversion? Explain briefly the reaction path. 2

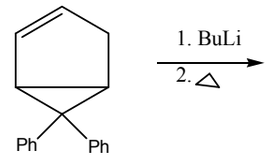



c) Predict the product of the reaction and possible intermediate with stereochemistry of the final product: 2+2



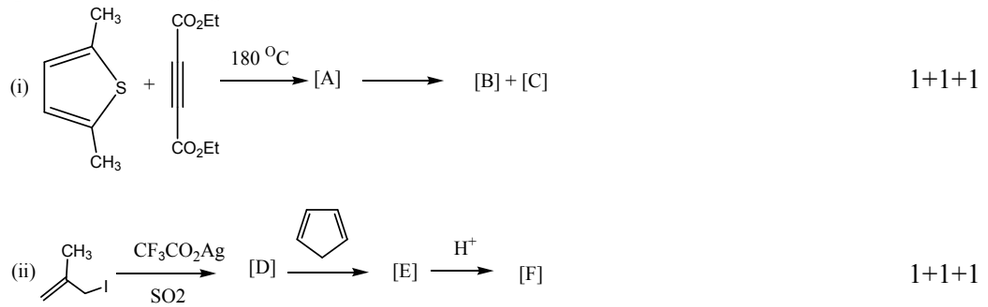

5. a) Explain Alder's endoselectivity in cycloaddition (4+2) reaction with proper example and reaction. 1+1

b) Predict the product of the following reaction with possible reaction pathway. 2





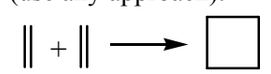

c) Complete the following reactions (structure of A to F):



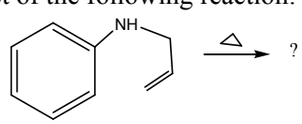

1+1+1

1+1+1

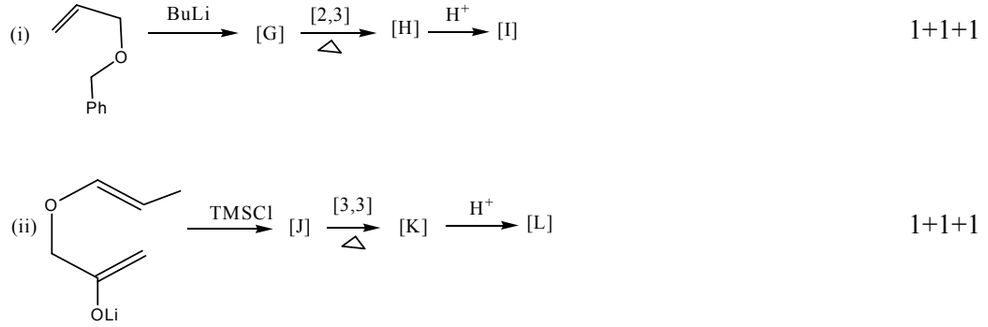
6. a) Determine whether the following supra-supra cycloaddition is symmetry allowed under thermally or photochemically (use any approach). 3



b) Write down the final product of the following reaction: 1




c) Write down the products G to L of the following reaction:




1+1+1

1+1+1