

THE COLLEGE OF THE BAHAMAS



EXAMINATION

SEMESTER 01-2007

FACULTY OF PURE AND APPLIED SCIENCES
SCHOOL OF SCIENCES AND TECHNOLOGY

- NASSAU
 FREEPORT
 EXUMA
 ELEUTHERA

DATE AND TIME OF EXAMINATION: Friday, April 20, 2007 at 2:00 p.m.
DURATION: 3 HOURS

COURSE NUMBER: Chemistry 330

COURSE TITLE: Organic Chemistry II

STUDENT NAME:

STUDENT NUMBER:

LECTURER'S NAME: Dr. D. Davis

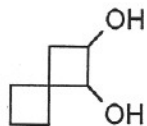
INSTRUCTIONS TO CANDIDATES:

This examination paper consists of 12 questions on 7 pages (excluding this instruction page). Answer ALL questions in the spaces provided on the examination paper.

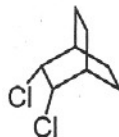
Only handheld calculators are allowed during this examination. The use of any other electronic device, e.g., cellular phone or PDA, is strictly prohibited for the duration of this examination.

1. Give the correct systematic name for the following compounds.

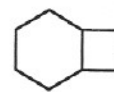
(a)



(b)



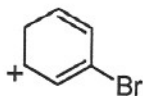
(c)



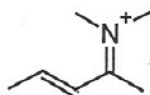
[3 marks]

2. Draw all of the (reasonable) other resonance structure(s) AND indicate the most/more stable resonance contributor in each set of structures. State the reason for your choice of the most stable contributor. Do not include structures that are so unstable that their contribution to the resonance hybrid would be negligible.

(a)



(b)



[4 marks]

3. Cyclopentadiene can react with itself in a Diels-Alder reaction. Draw the chemical equation and label the endo and exo products.

[4 marks]



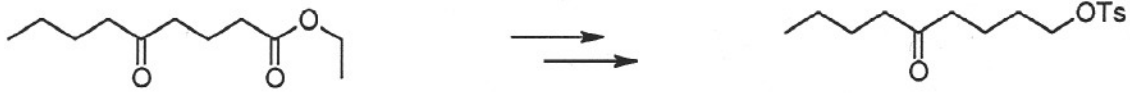
4. Provide a reaction scheme to show the preparation of the following compounds from starting materials indicated. Mechanisms are NOT required. More than one step may be required to arrive at the product shown.



[9 marks]

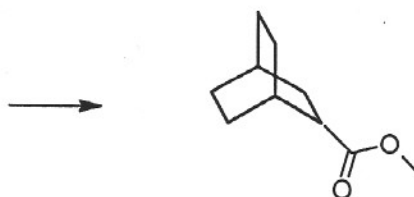
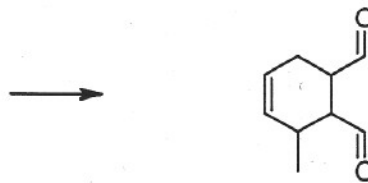
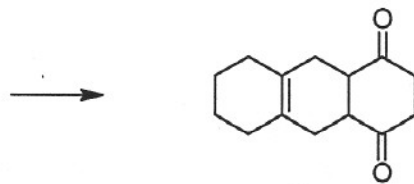


5. Provide a reaction scheme to show the preparation of the following compounds from starting materials indicated. Mechanisms are NOT required. More than one step may be required to arrive at the product shown.

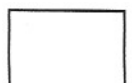


[3 marks]

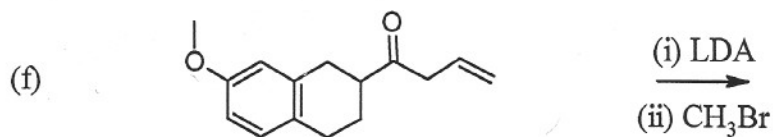
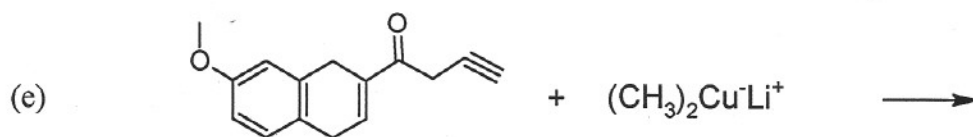
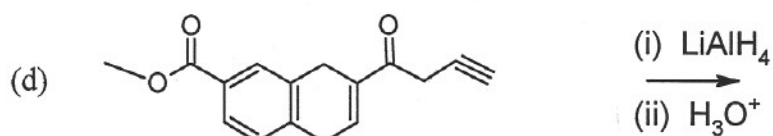
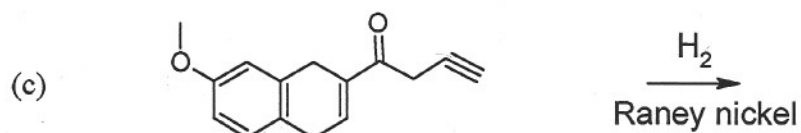
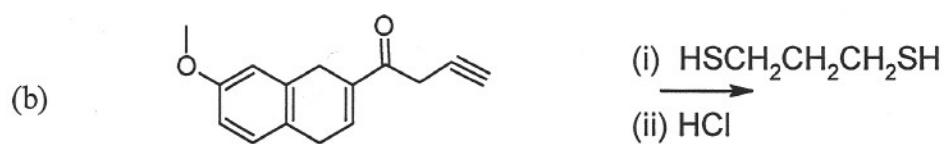
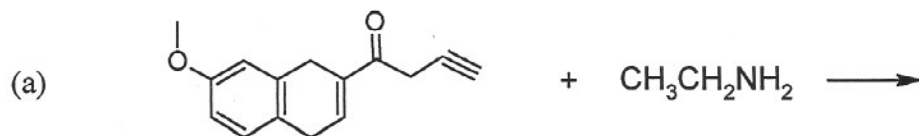
6. Draw the structure of the diene and dienophile that can be used to prepare the following compounds?



[6 marks]



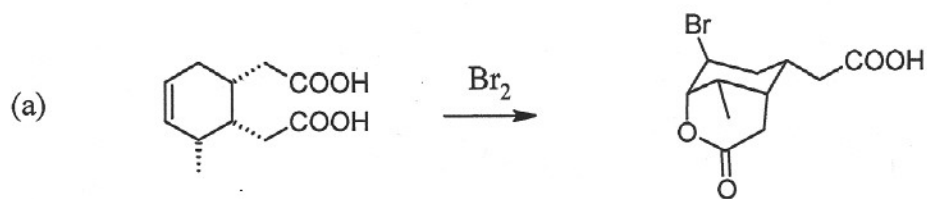
7. Draw the reactant(s)/major product(s) for the following reactions. If no reaction occurs indicate by writing "no reaction".



[8 marks]

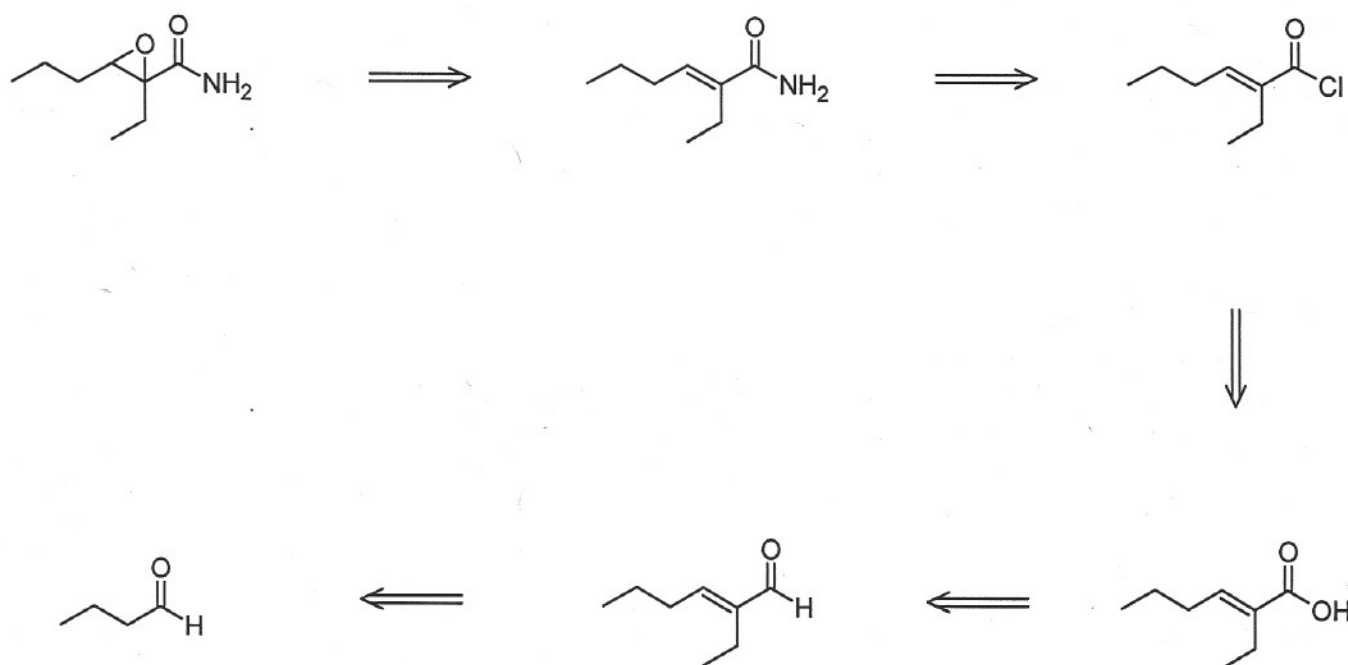


8. Propose a curved arrow mechanism to account for the formation of the products indicated in the reaction given below. Explain the stereochemistry of the reaction where applicable.

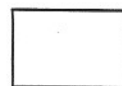


[4 marks]

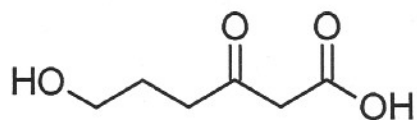
9. The retrosynthetic scheme below shows the preparation of the sedative, oxanamide, from butanal. Give the structure of the necessary reagents to complete this synthesis.



[6 marks]



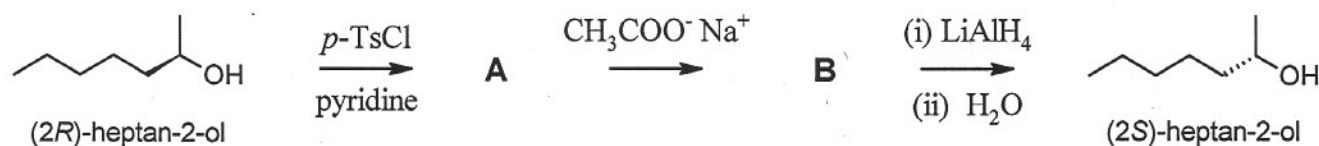
10. The compound shown below has four protons that can be abstracted by a suitable base. The pKa values are estimated to be 4.9, 11, 16, and 24.



- (a) Assign these pKa's to their respective protons in the molecule. Points will only be awarded for unambiguous assignments.
- (b) Give a reason for each of your assignments.

[4 marks]

11. The following reaction scheme shows the conversion of (2*R*)-heptan-2-ol to (2*S*)-heptan-2-ol.

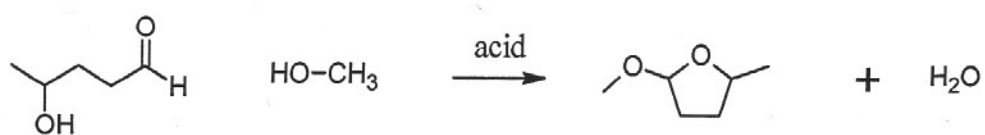


- (a) Draw the structures of intermediates **A** and **B**.
- (b) Account for the change in configuration in the sequence.

[4 marks]



12. Propose a curved arrow mechanism that accounts for the products formed in the reaction below.



[4 marks]

***** End of Examination *****

