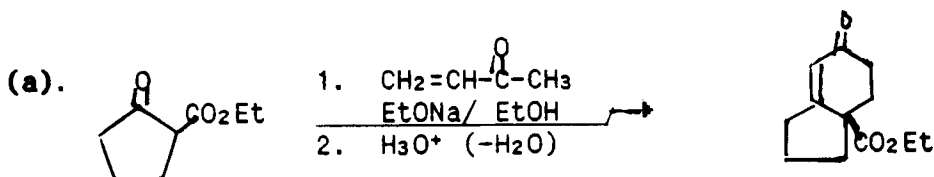


(13) 1.	(18) 4.
(22) 2.	(22) 5.
(14) 3.	(12) 6.

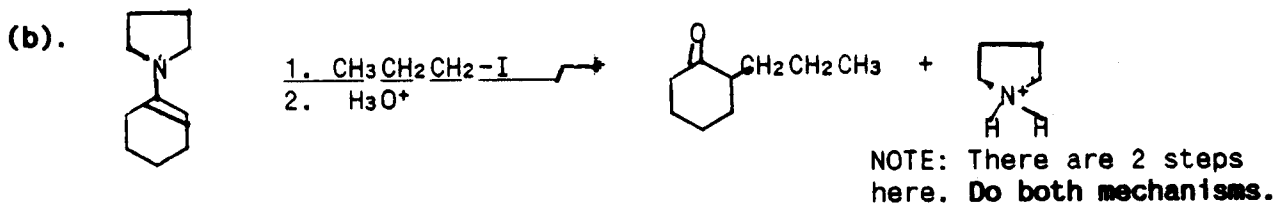
Please use a non-red pen. Answer questions in the provided space. If you write any answers on the back of the page, indicate this on the front of that page. **Good Luck!**

Note: Points appear in () and in margin.

- (12) 1. Write step-by-step mechanisms for each of the following reactions. Use arrows to show electron flow.

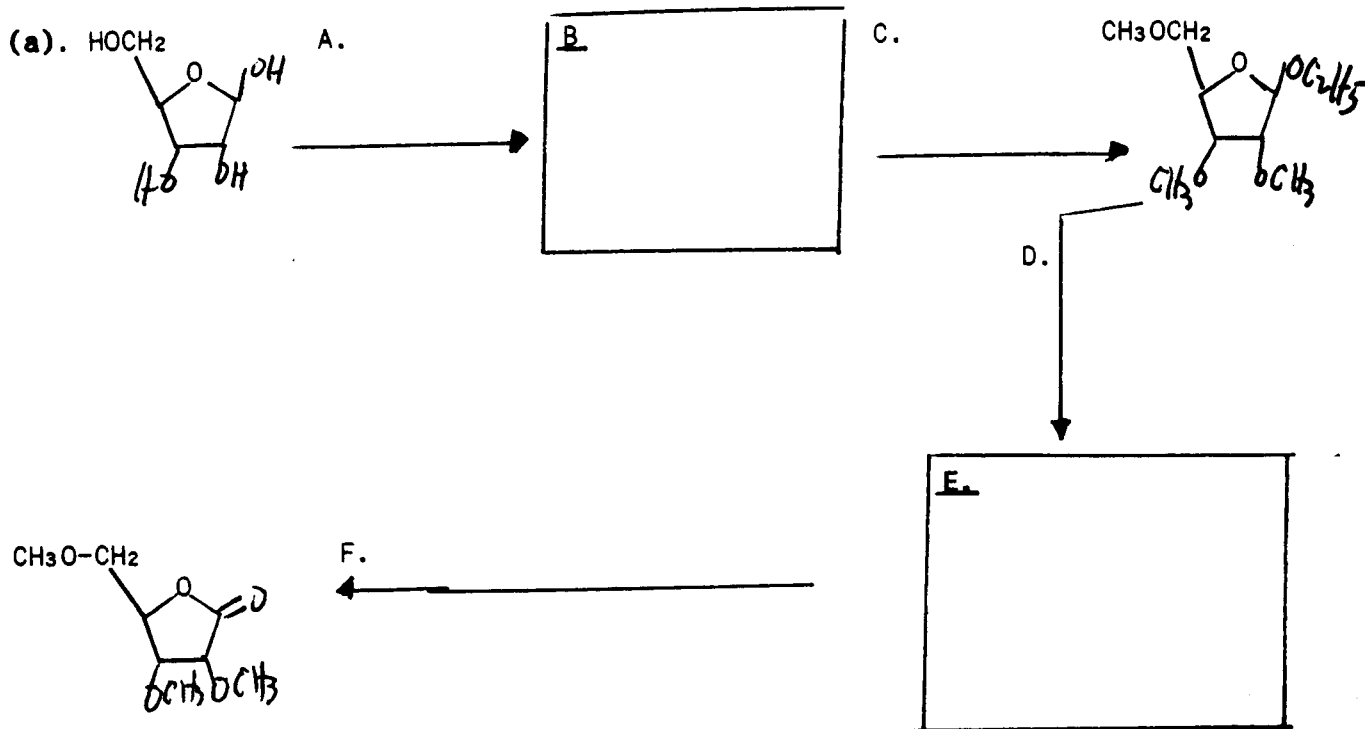


6 pt



6 pt

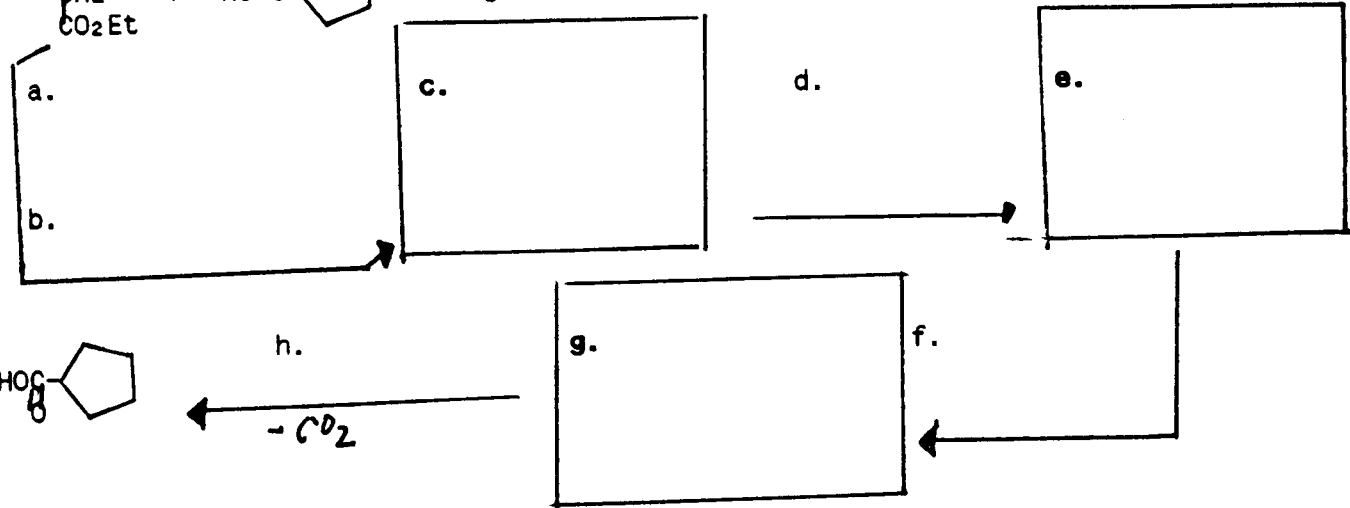
(22) 2. Write the structures of the necessary inorganic/organic reagents or the expected major organic products (A to F) in each of the following conversions:



12pt
(2pt
each)

8pt
(1pt
each)

(b)

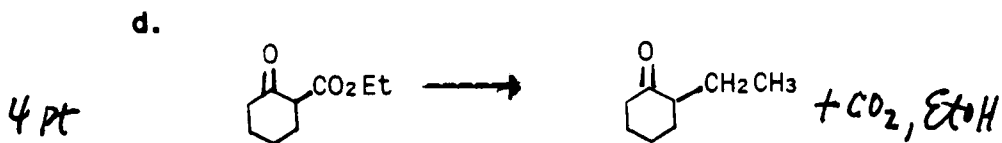
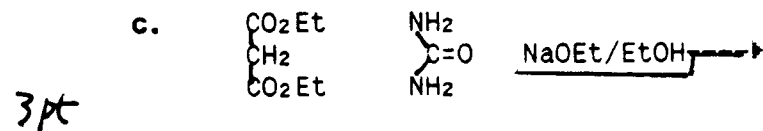
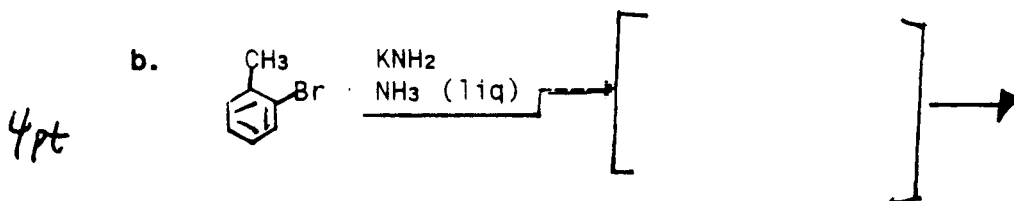
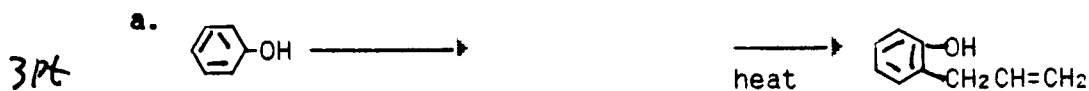


(c). Intramolecular cyclization reactions, such as the Dieckmann condensation of a diester to prepare a β -ketoester, are best carried out in very dilute solutions of the compound to be cyclized. Why is this so? (circle one correct answer).

1. It is then possible to use less base.
2. The reagents used are generally expensive.
3. A smaller amount of the compound to be cyclized can be used.
4. Intermolecular condensation is minimized at low concentration.
5. The concentration factor is not important.

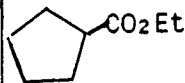
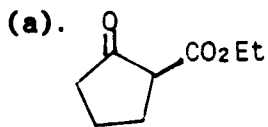
3.

(14) Write the structures of the major organic product(s) and/or reagents and intermediate products for each of the following conversions:



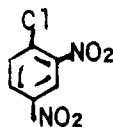
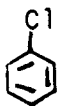
 SCRAP

(18) 4. Write a chemical reaction or a test which differentiates the members of each of the following pairs of compounds. Write the structures of all major organic/inorganic products that form. For a test, write also what you see **FOR BOTH COMPOUNDS.**



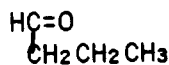
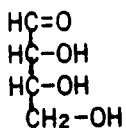
6 Pt

(b).



6 Pt

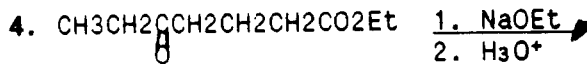
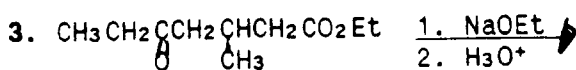
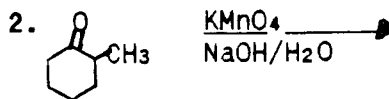
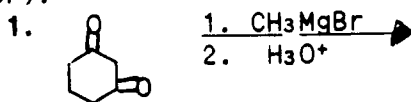
(c).



6 Pt

(22) 5a. 2-Methylcyclohexane-1,3-dione (M) can be synthesized from (circle correct answer):

2 pt



5. None of the above.

(b). Write the structure for M based on its name.

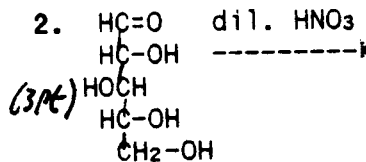
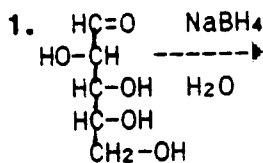
2 pt

(c). Write a possible structure for the mono enol of M. Is this structure expected to be more stable than are most enols? Explain your answer.

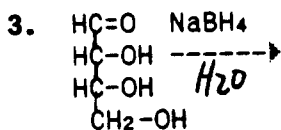
(4 pt)

(d). Which of the following sugars will not lose their optical activity after the described reaction occurs. Explain and write the structures of the expected major organic product(s) **FOR ALL 3 REACTIONS!**

3 pt

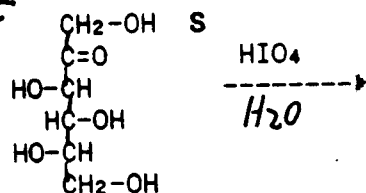


3 pt

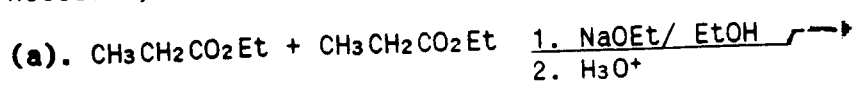


5 pt

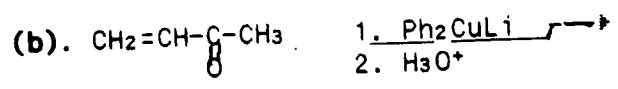
5(e). In the reaction of HIO_4 with sorbose (S), how many moles of HIO_4 are consumed? Also write the structures and number of moles of each expected product.



12
6. Write the structures of the expected major organic product(s) or the necessary inorganic/ organic reagents for each of the following conversions:



3pt



3pt

Write a structure for :

(c). a D-aldopentose

3pt

(d). a non-reducing sugar or sugar derivative

3pt