

Simulated Final Exam (SF15Oc1FB)

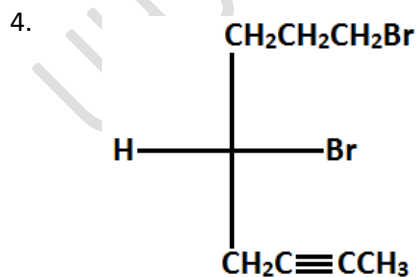
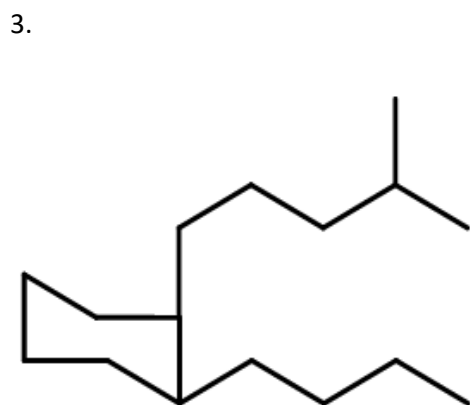
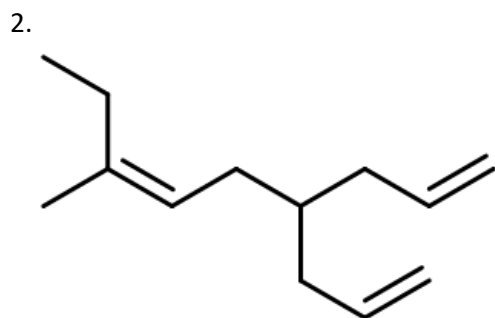
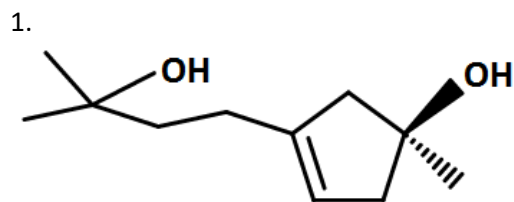
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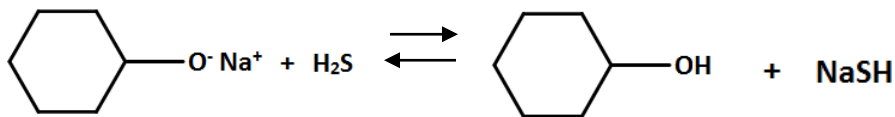
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A. Nomenclature: Name each of the compounds in the box provided using IUPAC naming including stereochemistry if applicable. Use a Fischer Projection for question 3 (12).

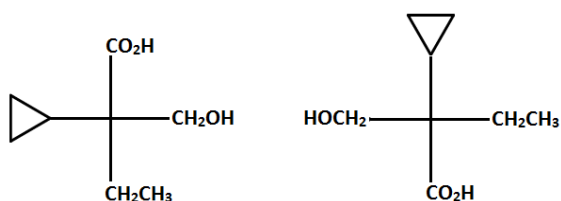


B. Facts (26)

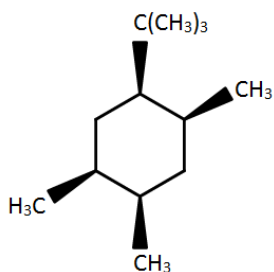
1. Below, indicate where equilibrium lies (Right or Left), (2).



2. Indicate the type of isomers for those below (identical, structural, enantiomers, diastereomers (2).

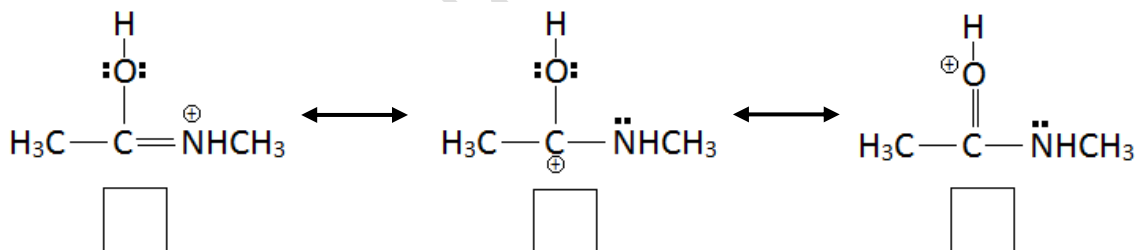


3. Indicate the number of axial methyl groups when the cyclohexane is in the more stable conformation (2).



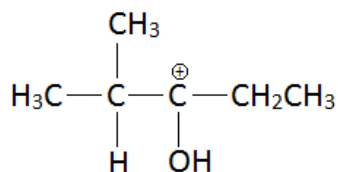
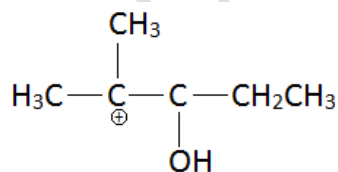
Number =

4a. Rank resonance contribution to those given below (3 = most, 1 = least), (3)

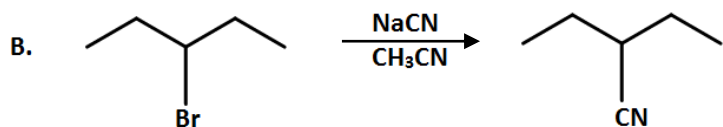
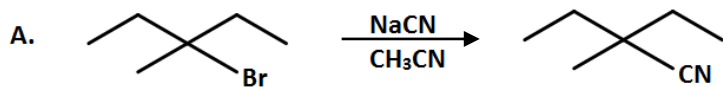


4b. What is the hybridization of oxygen?

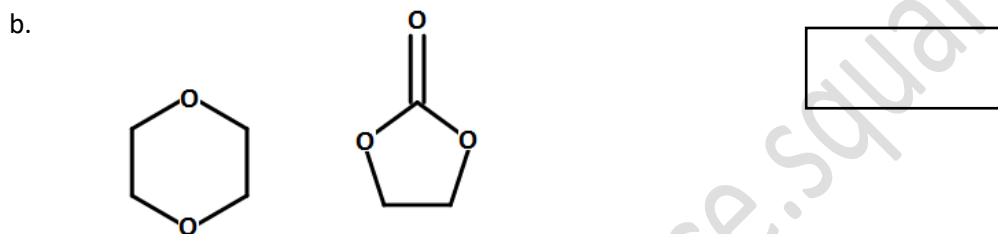
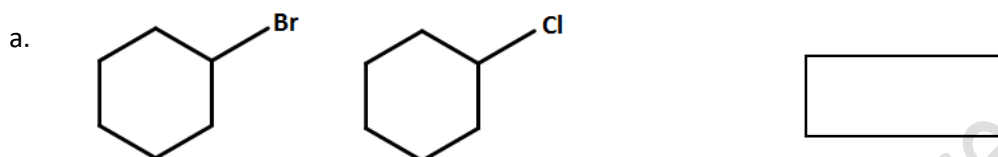
5. Circle the more stable compound.



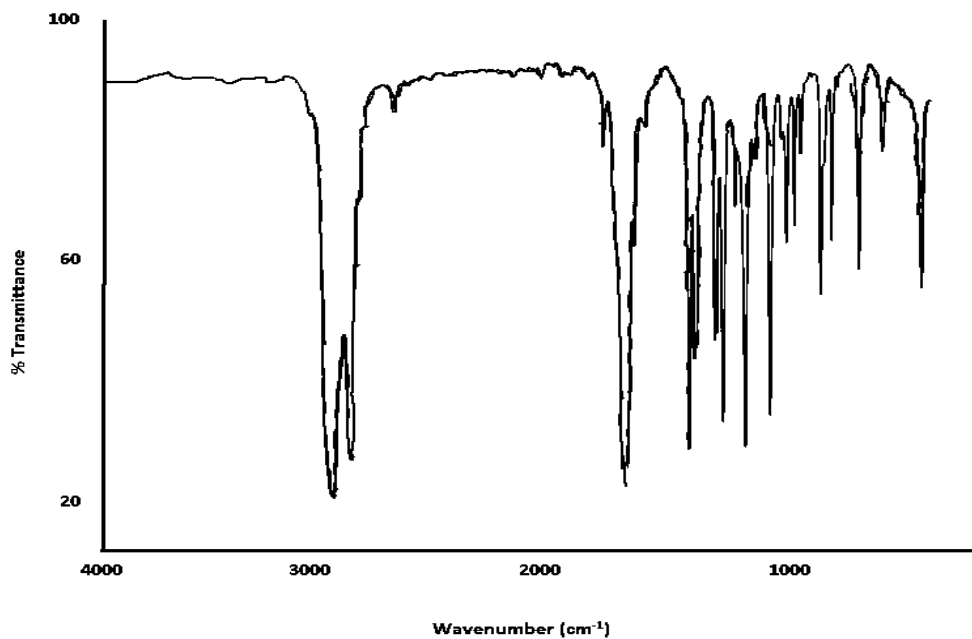
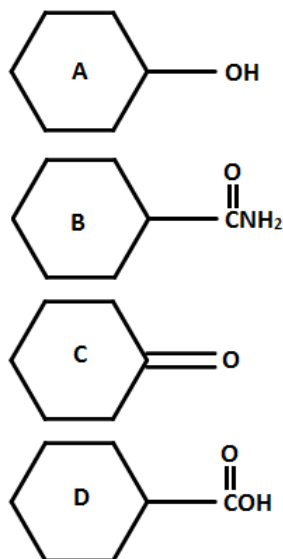
6. Circle the faster reaction (2).



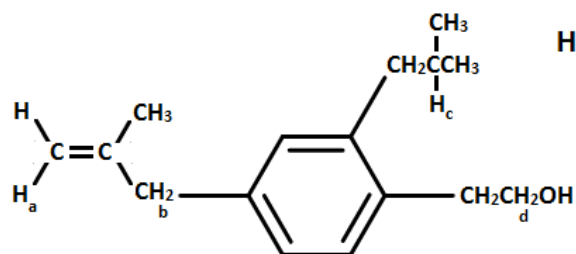
7. Which technique (MS, NMR, IR) could be used to identify the difference between the compounds given below. Give the most straightforward technique (4).



8. Circle the compound that goes with the spectrum



9 (5)



H_a multiplicity

H_c multiplicity

H_b multiplicity

H_d multiplicity (normal purity)

H_d multiplicity (ultrapure)

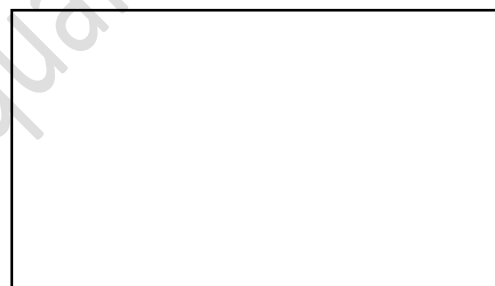
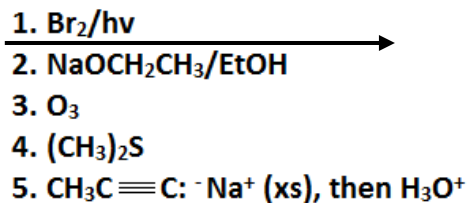
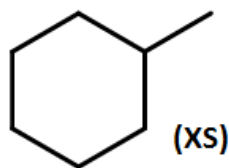
i. What are the theoretical splitting patterns (multiplicities) for the molecule above (assume normal purity levels)?

ii. Indicate the theoretical splitting patterns (multiplicities) for H_a

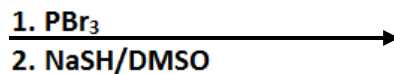
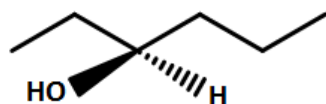
C. Reactions (36)

Draw the product with stereochemistry when appropriate. Give the major product if more products exist that boxes provided.

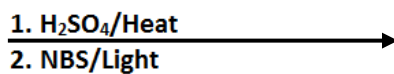
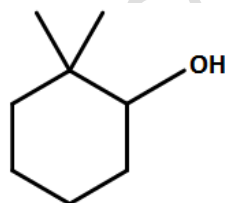
1.



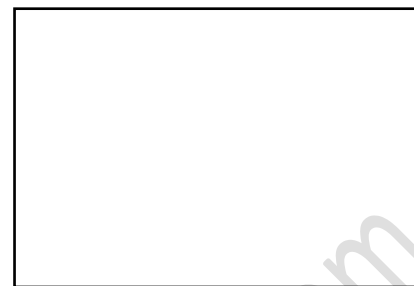
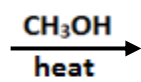
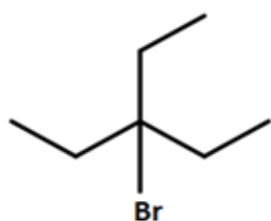
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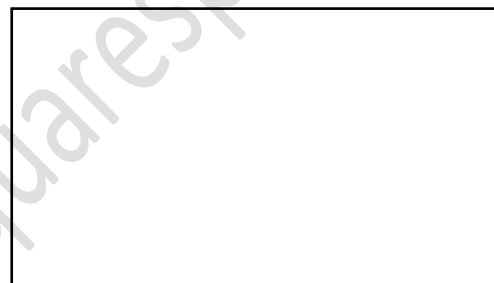
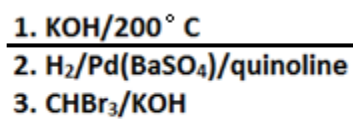
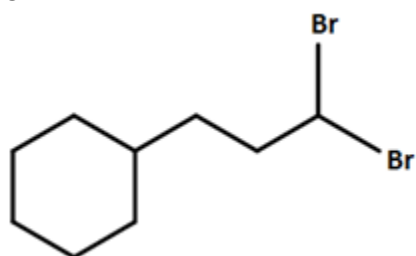
3.



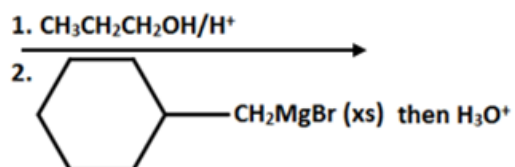
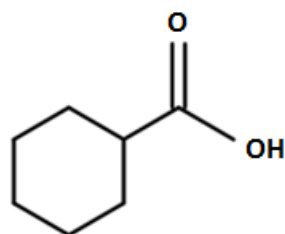
4.



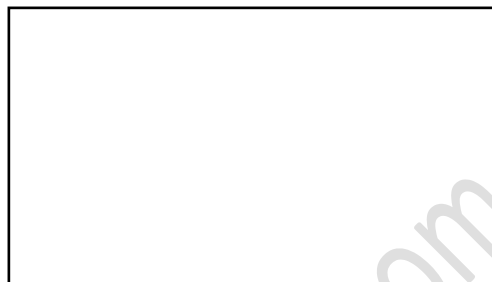
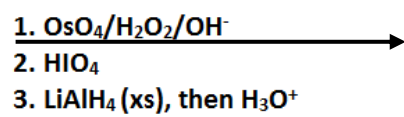
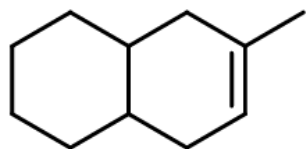
5.



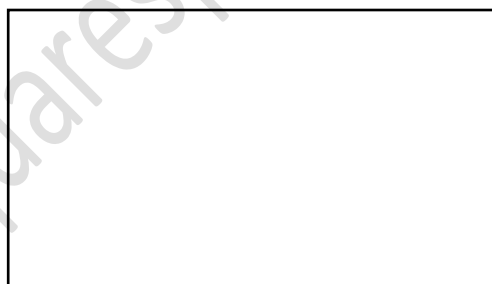
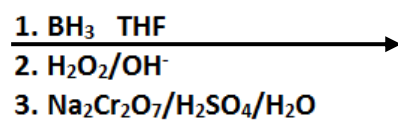
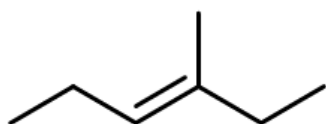
6.



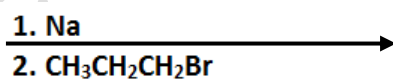
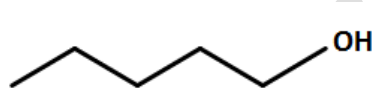
7.



8.

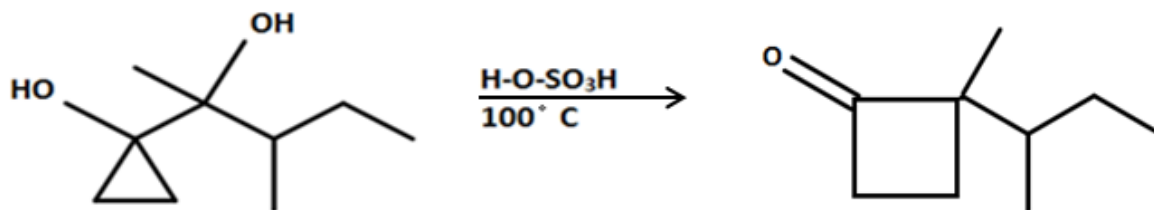


9.



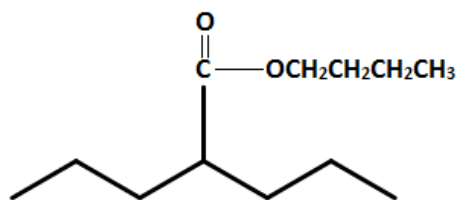
D. Mechanism (10)

Give the mechanism to form the products given below using curved arrows. Show all intermediates and formal charges.



E. Synthesis (10)

Synthesize the given using alcohols or alkenes of 4 carbons or less any inorganic reagents and oxidizing or reducing agents.



E. Spectroscopy (6)

Draw the compound ($C_8H_{10}O$) given the data below.

