

# Simulated Exam III (SF150c1E3B)

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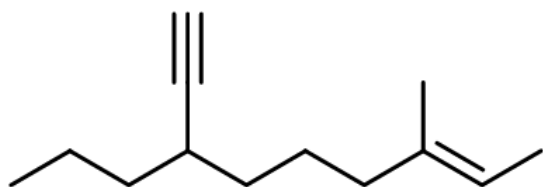
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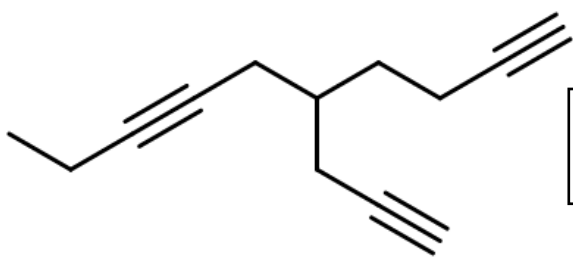
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**A. Nomenclature:** Name each of the compounds in the box provided using IUPAC naming including stereochemistry if applicable. Use a Fischer Projection for question 3 (15).

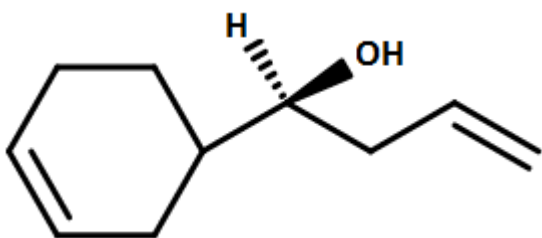
1.



2.

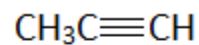
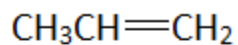
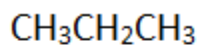


3.

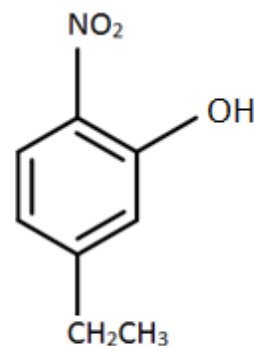
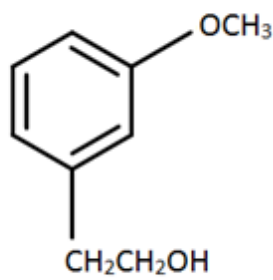
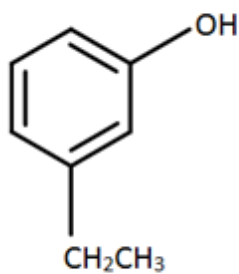


**B. Facts (24)**

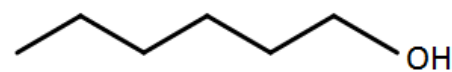
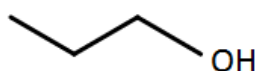
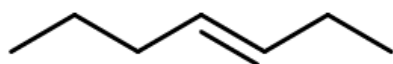
1. For those given below, rank in order of increasing  $\text{H}_3\text{O}^+$  reaction rate (1 = slowest, 3 = fastest), (6).



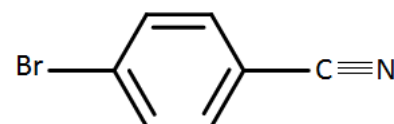
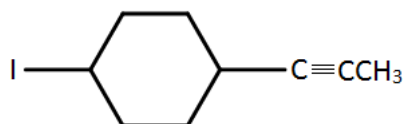
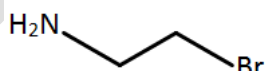
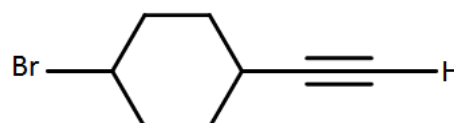
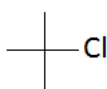
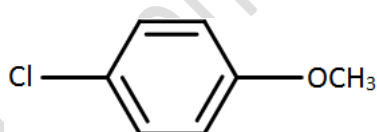
2. Rank the following in order of increasing acidity (1= least, 3 = most), (6)



3. Rank the following in order of increasing hexane solubility (1 = least, 3, most), (6)



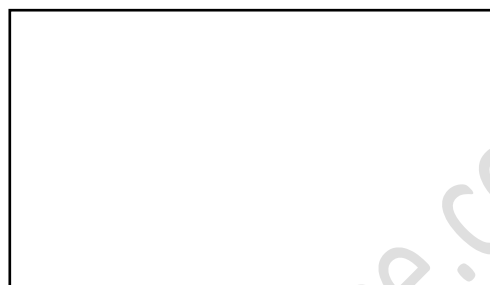
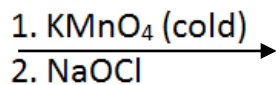
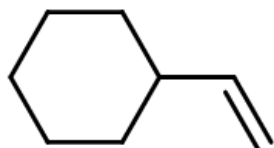
4. For each of the following, indicate if a useful Grignard reagent can be produced (Y = YES, N = NO) (6)



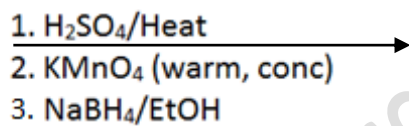
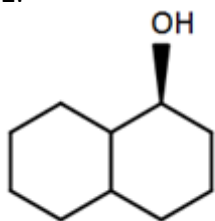
**C. Reactions (36)**

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

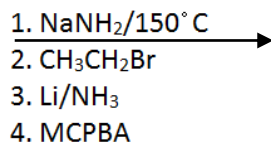
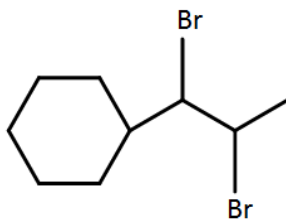
1.



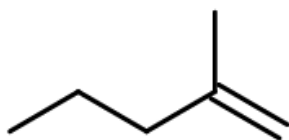
2.



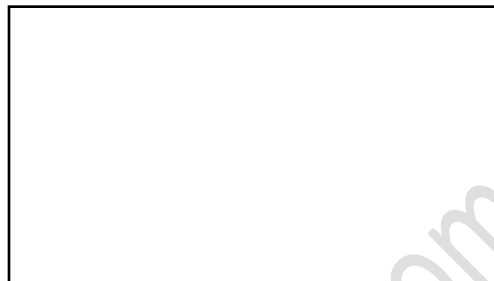
3.



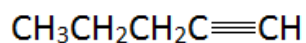
4.

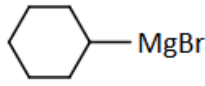


1.  $\text{BH}_3 \cdot \text{THF}$
2.  $\text{H}_2\text{O}_2/\text{OH}^-$
3.  $\text{PCC}/\text{CH}_2\text{Cl}_2$
4.  $\text{CH}_3\text{C}\equiv\text{C}^- \text{Na}^+$ , then  $\text{H}_3\text{O}^+$



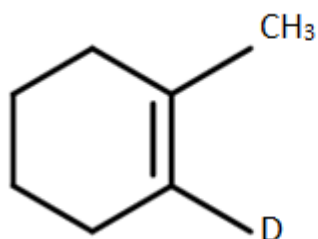
5.



1.  $\text{H}_2\text{SO}_4/\text{H}_2\text{O}/\text{HgSO}_4$
2.  then  $\text{H}_3\text{O}^+$
3.  $\text{HCl}/\text{Ether}/0^\circ\text{C}$



6.

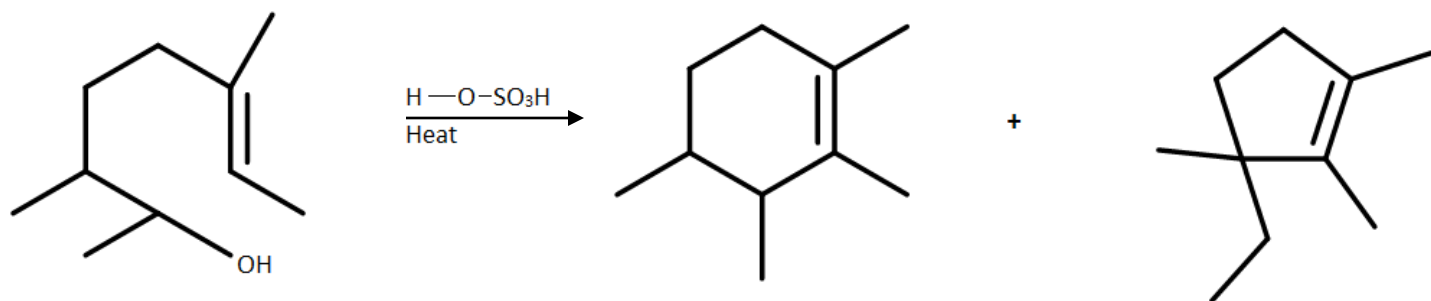


1.  $\text{Hg}(\text{OAc})_2/\text{H}_2\text{O}$
2.  $\text{NaBH}_4$
3.  $\text{TsCl}/\text{pyridine}$
4.  $\text{NaCN}/\text{CH}_3\text{CN}$



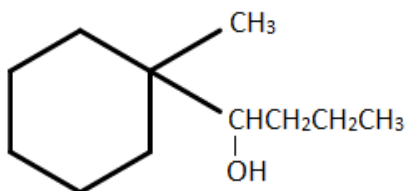
**D. Mechanism (13)**

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



**E. Synthesis (12)**

Synthesize the given molecule using cyclohexanol, alkanes or alcohols that are 2 carbons or less with any inorganic reagents and oxidizing or reducing agents.



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