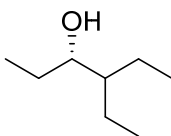


Name: _____

Select the correct solution for each multiple-choice question. (2 points each)

1. Identify the correct IUPAC name for the following structure.



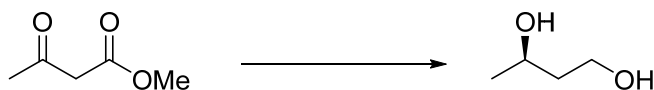
a. (R)-4-ethyl-3-hexanol

c. (R)-1,2-diethyl-1-butanol

b. (S)-4-ethyl-3-hexanol

d. (S)-1,2-diethyl-1-butanol

2. Circle the reagents required for the given reaction.



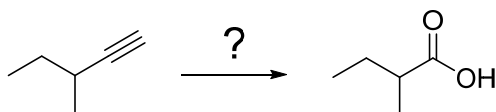
a. 1. 9-BBN

c. NaBH₄, MeOH2. H₂O₂, NaOHd. 1. LiAlH₄ (excess)

b. 1. MeMgBr (excess)

2. H₂O2. H₂O

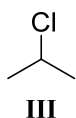
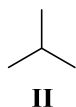
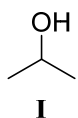
3. Circle the reagents required for the given reaction.



a. 1. 9-BBN

c. 1. O₃2. H₂O₂, NaOH2. H₂Ob. dilute H₂SO₄d. HgSO₄, H₂SO₄
H₂O

4. Rank the boiling points for following compounds from
- highest to lowest**
- .



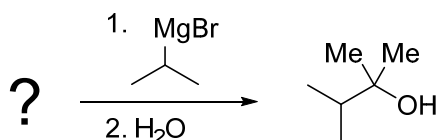
a. I>II>III

c. I>III>II

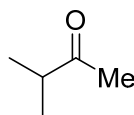
b. II>III>I

d. III>II>I

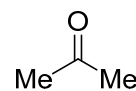
5. Circle the starting material to yield the following alcohol in the reaction below.



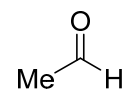
a.



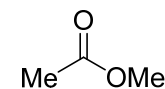
b.



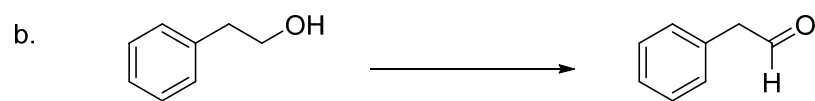
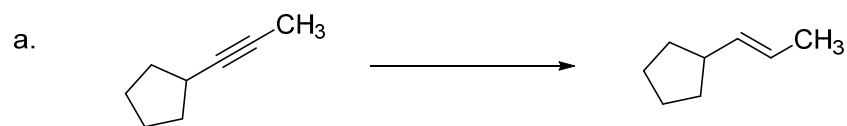
c.



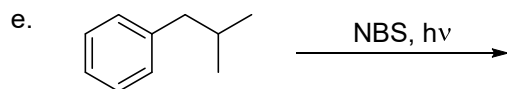
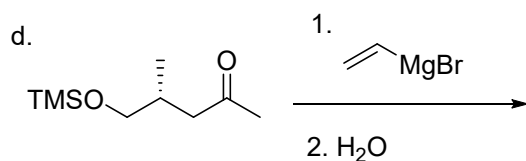
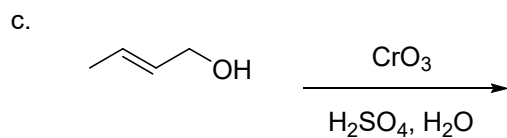
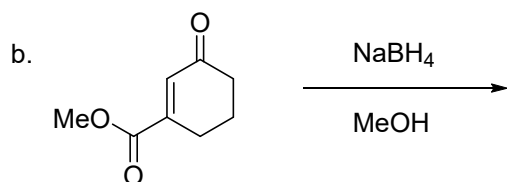
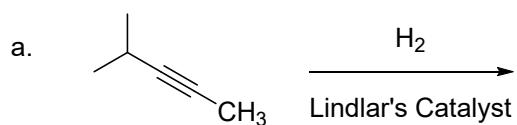
d.



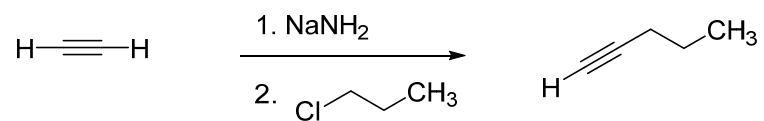
6. Provide the necessary reagents for the following reactions. You do not need to draw mechanisms for these problems. (4 points)



7. Provide the product for the following reactions. Be sure to clearly indicate stereochemistry where appropriate. You do not need to draw mechanisms for these problems. (10 points)



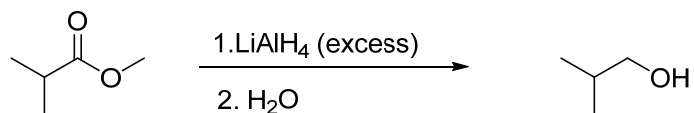
8. Provide a mechanism for the following reaction. (3 points)



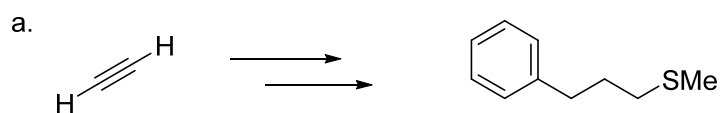
9. a. Provide a mechanism for the following reaction.
b. Label each step as initiation (I), propagation (P) or termination (T).
c. Explain the observed **regioselectivity** for the brominated product.
(6 points)



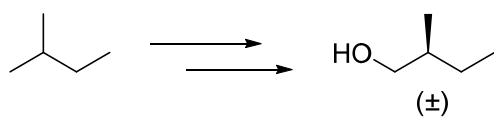
10. Provide a mechanism for the following reaction. (5 points)



11. Propose a synthesis for the following transformations. (8 points)



b.



12. Use the molecular formula ($\text{C}_{10}\text{H}_{12}\text{O}_2$), and spectra on the following page to determine the structure of the unknown compound. For the IR, provide assignments for the indicated signals. For the ^1H NMR and ^{13}C NMR, label each set of proton/carbon signals on your proposed structure (a,b,c,...). (10 points)

