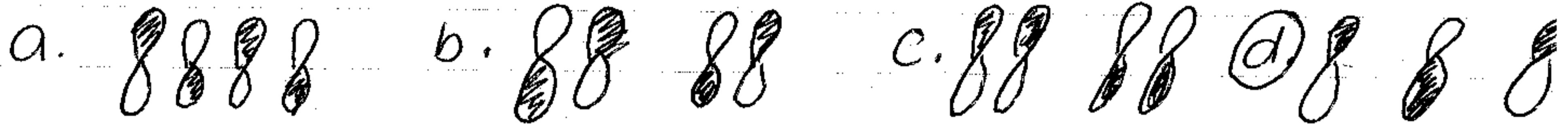
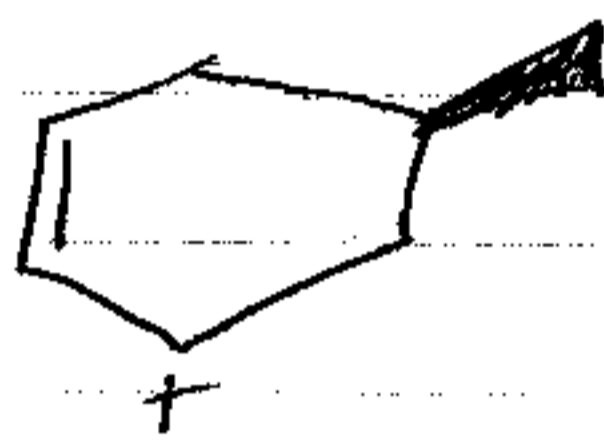


### Test 3

① What is the  $\pi$  LUMO of the pentadienyl cation?



② Which of the following allylic carbocations does not have 2 identical resonance structures?

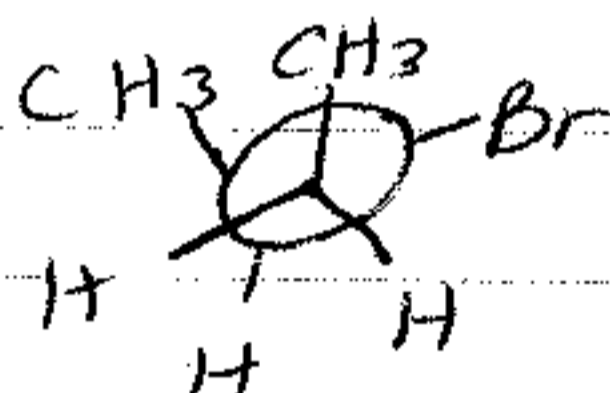


a.

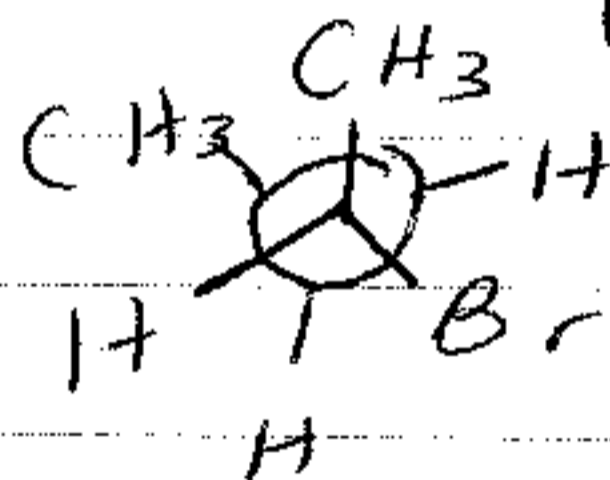
b.

c.

③ In the dehydrohalogenation of 2-bromobutane which conformation below leads ~~to~~ directly to the formation of cis-2-butene?

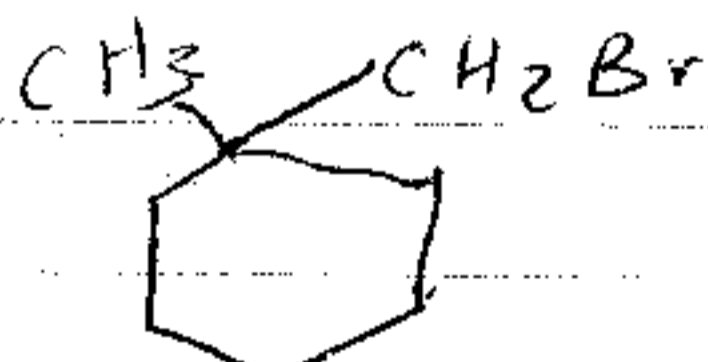


A.

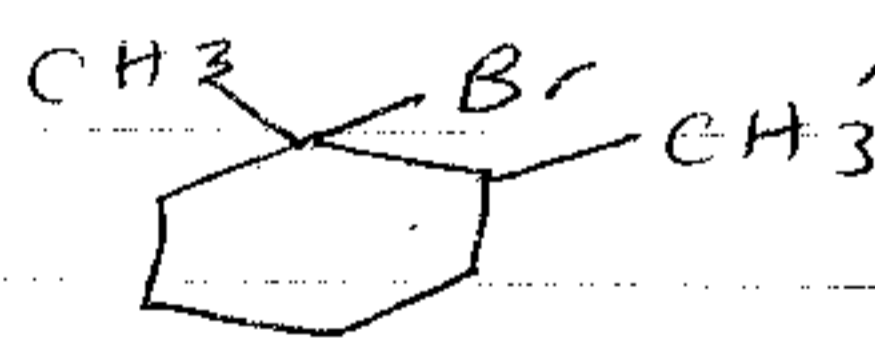


B.

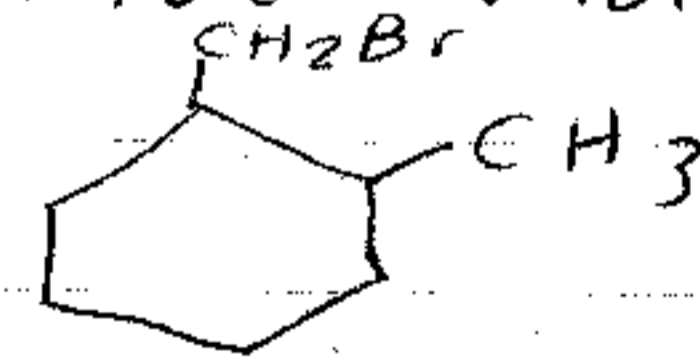
④ Which of the following cannot undergo an E2 rxn?



A.



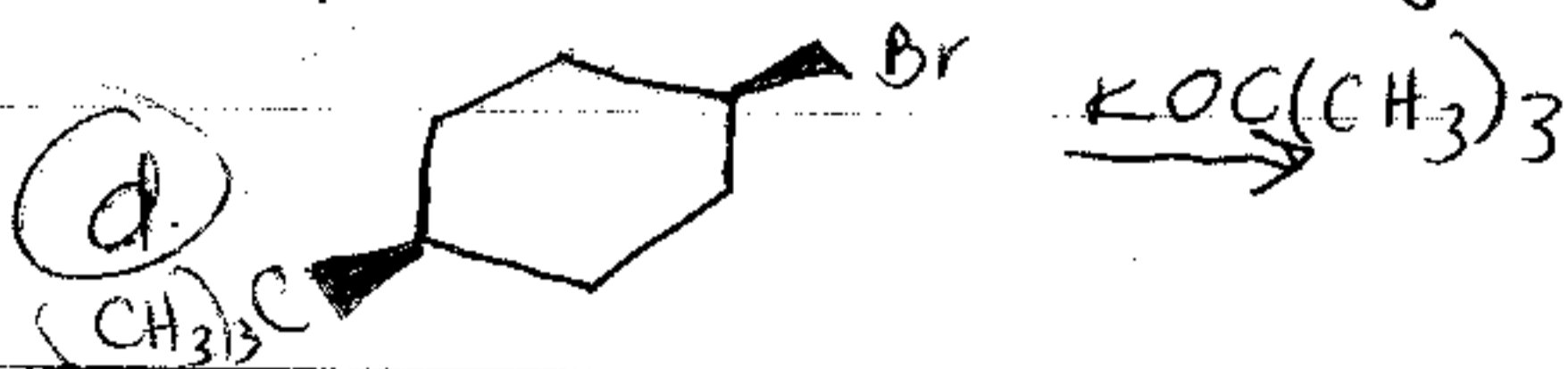
B.



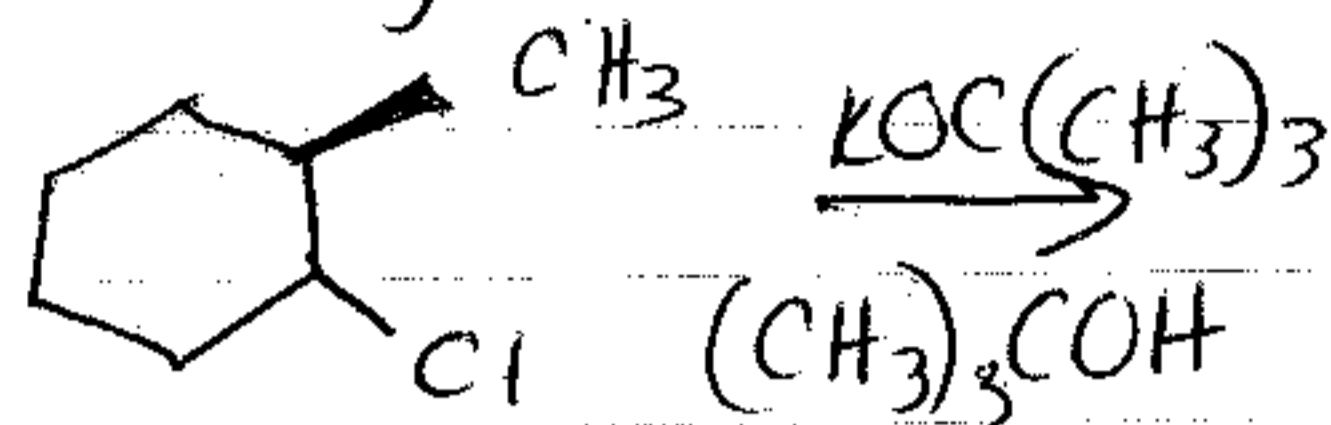
C.

d. None of the above

⑤ Which of the following would have the fastest rate of rxn to form 4-tertbutylcyclohexene?

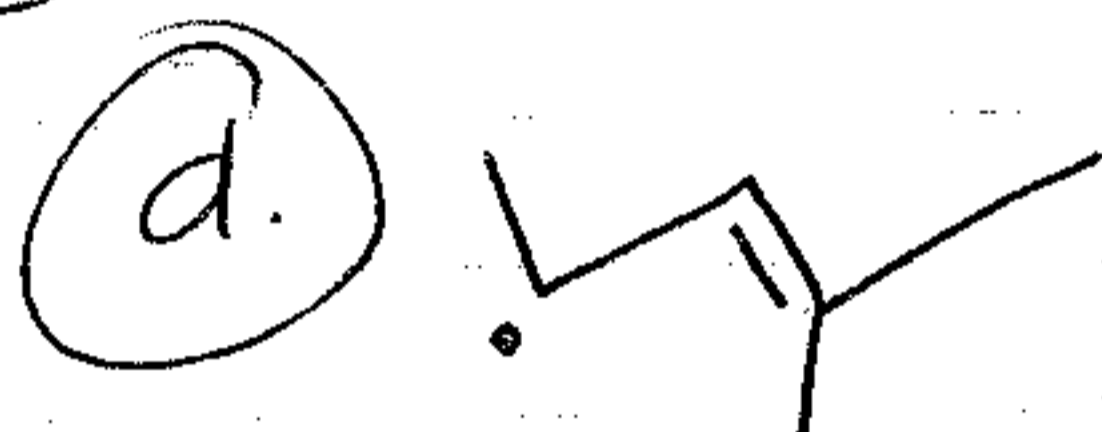


6) What product or products are expected for the following reaction?



- a. only 3-methylcyclohexene
- b. only 1-methylcyclohexene

7) Which is the most stable allyl radical?



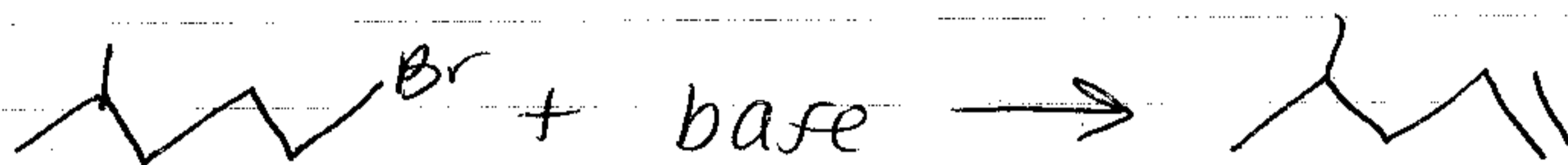
8) 1-chloro-4-fluorobutane is reacted with 1 equivalent of sodium iodide in acetone. During the reaction a precipitate forms. What is the precipitate?

- b.  $\text{ClCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{I}$
- c.  $\text{NaCl}$
- d.  $\text{NaF}$

9) Identify the major products in the reaction of (R)-2-bromopentane with  $\text{NaCN}$  in DMSO.

- a) (R)-2-cyanopentane
- b) (S)-2-cyanopentane

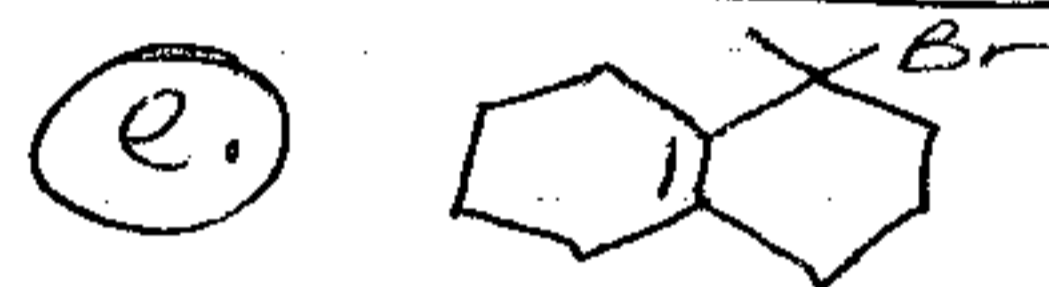
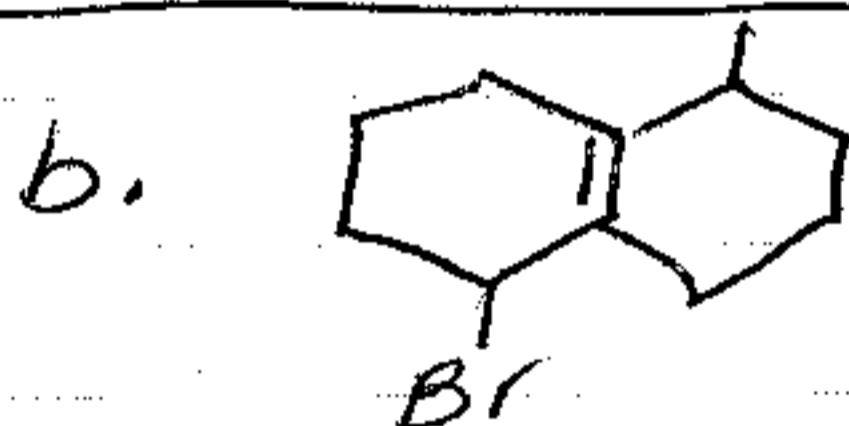
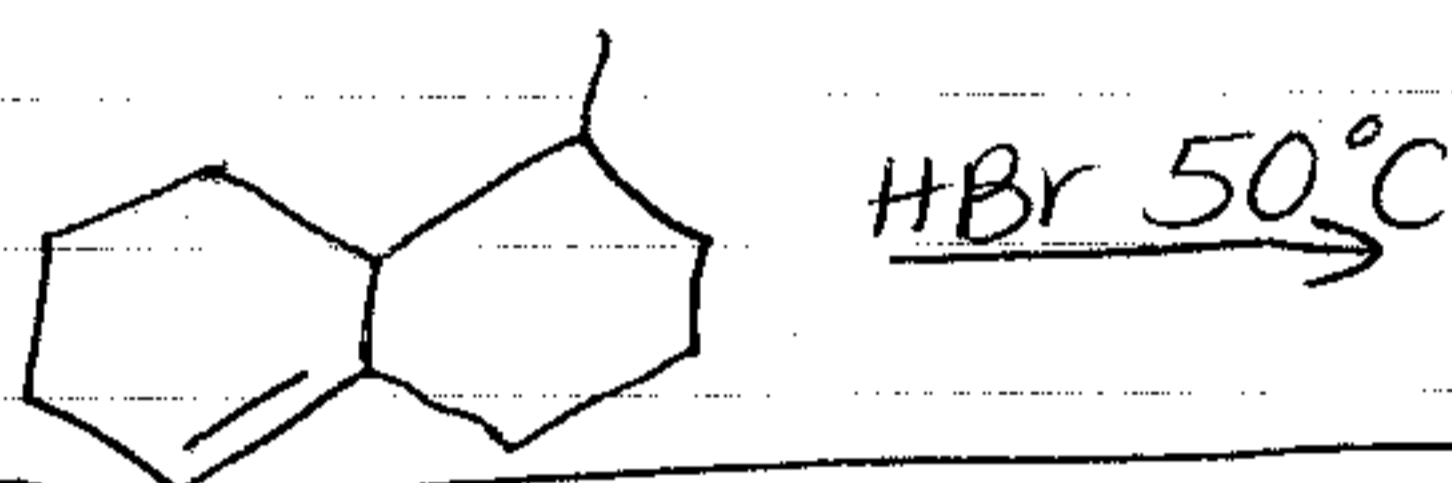
10) Which base is best to maximize the E2 product in the reaction below?



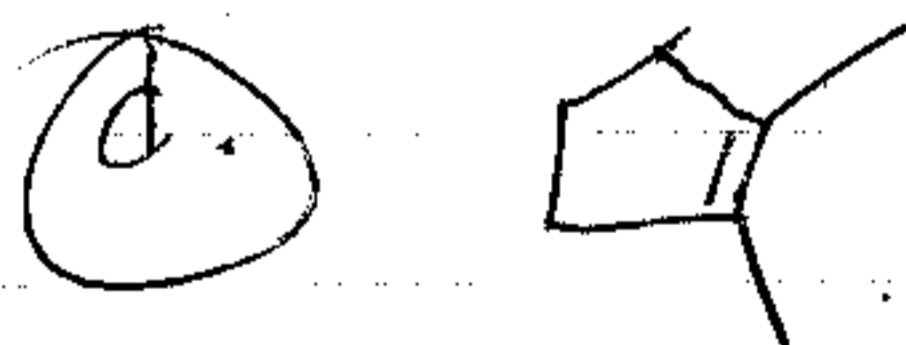
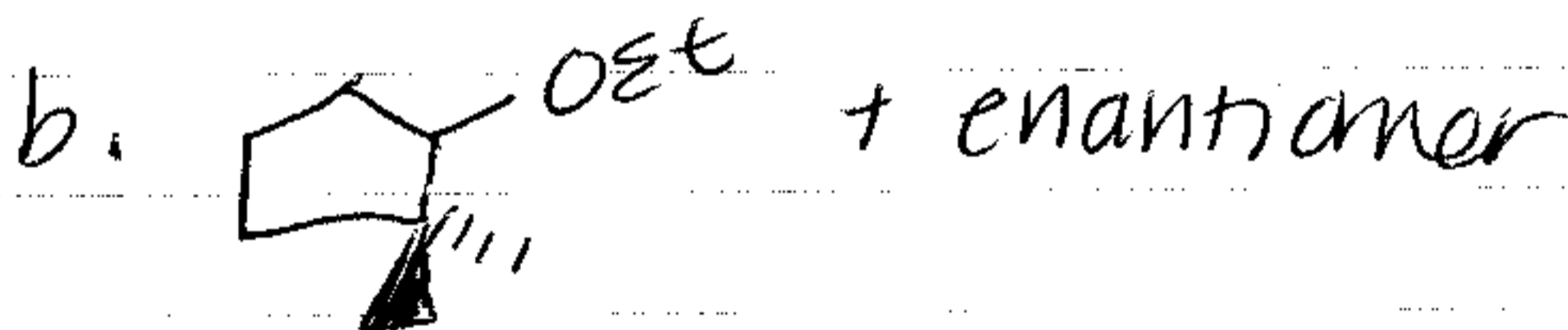
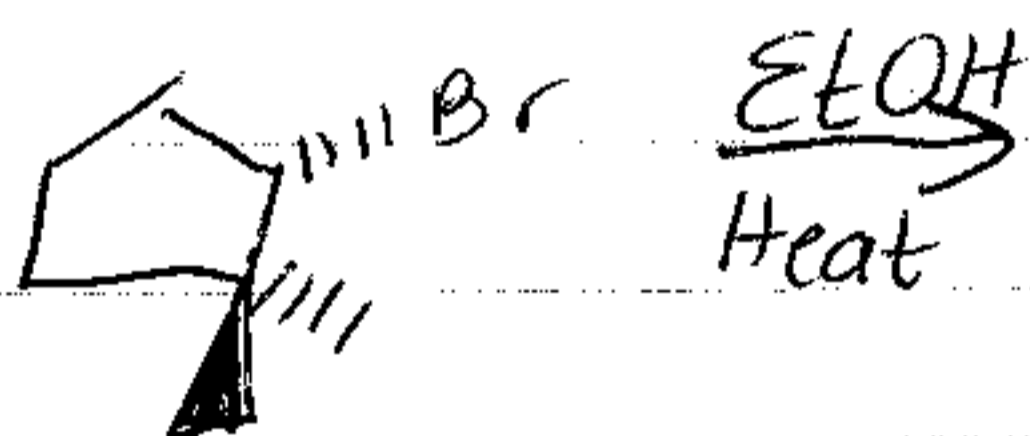
a. NaOC(CH3)3

b. NaNH

11) What is the product of the following reaction

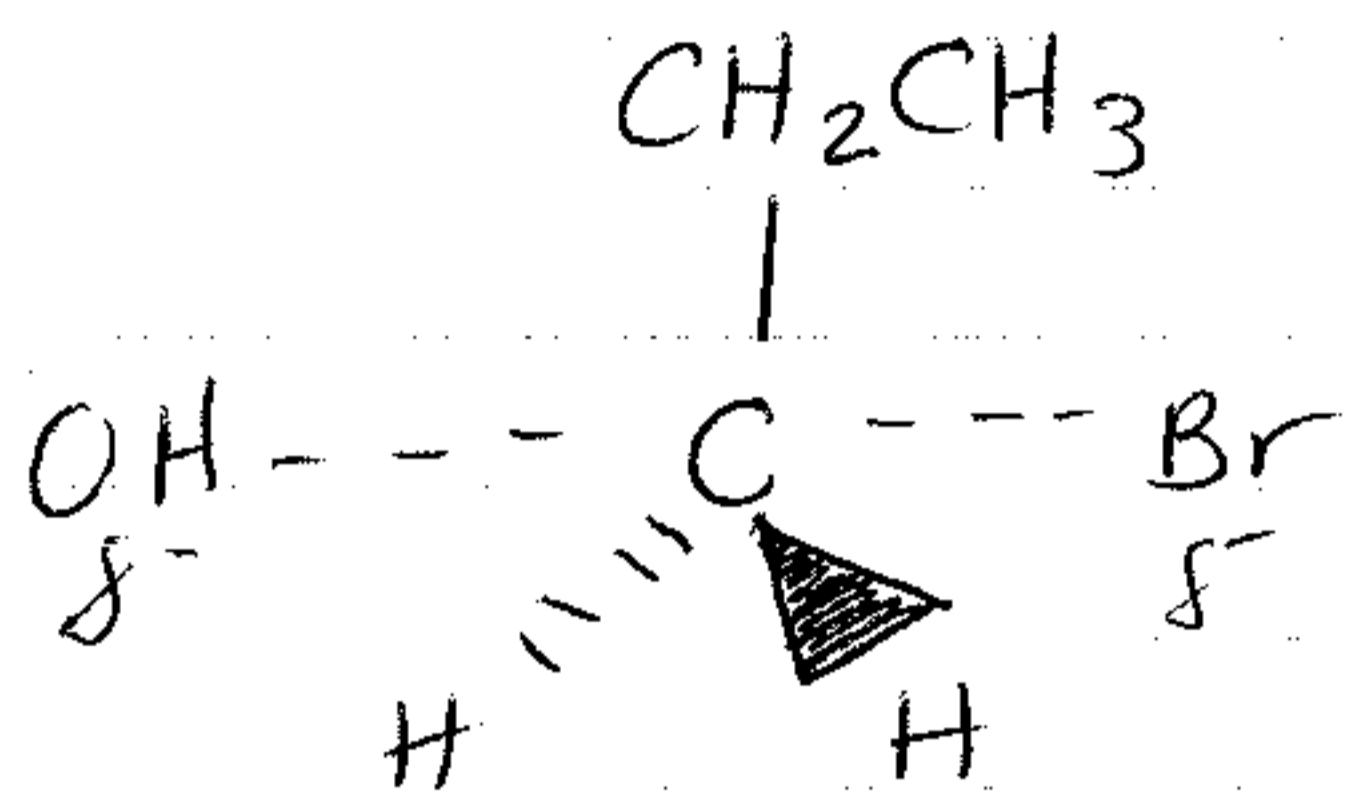


12) What is the major product of the following reaction?

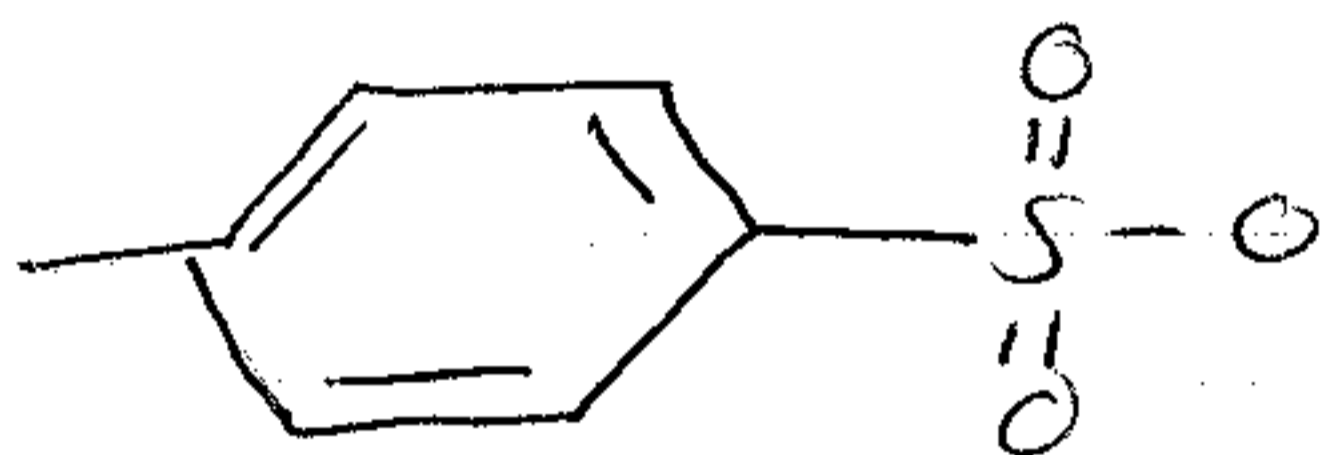


~~What is the major product?~~

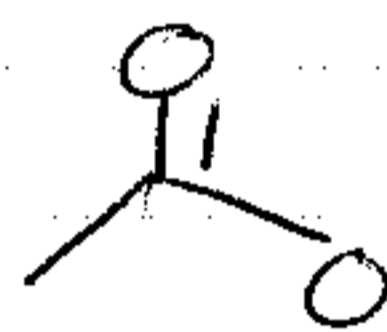
13) The species shown represents the transition state for



14) Rank in order of best L.G. >>> worst L.G.



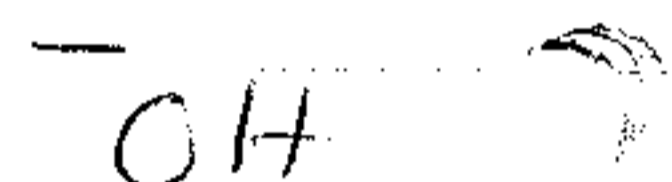
a.



b.

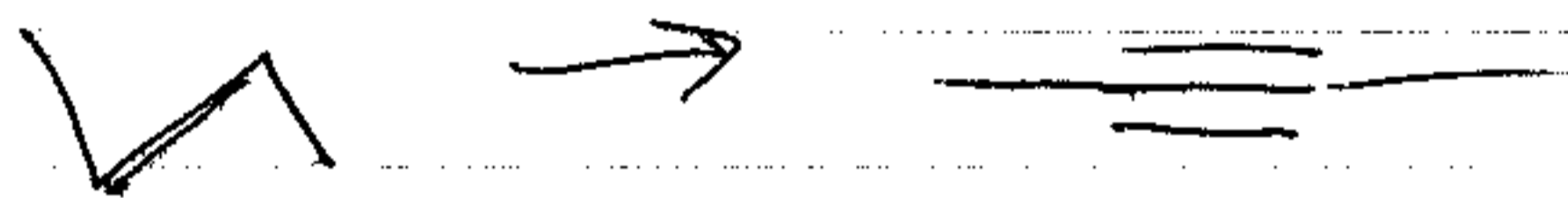


c.



d.

15) Which sequence of reagents would best accomplish the following transformation



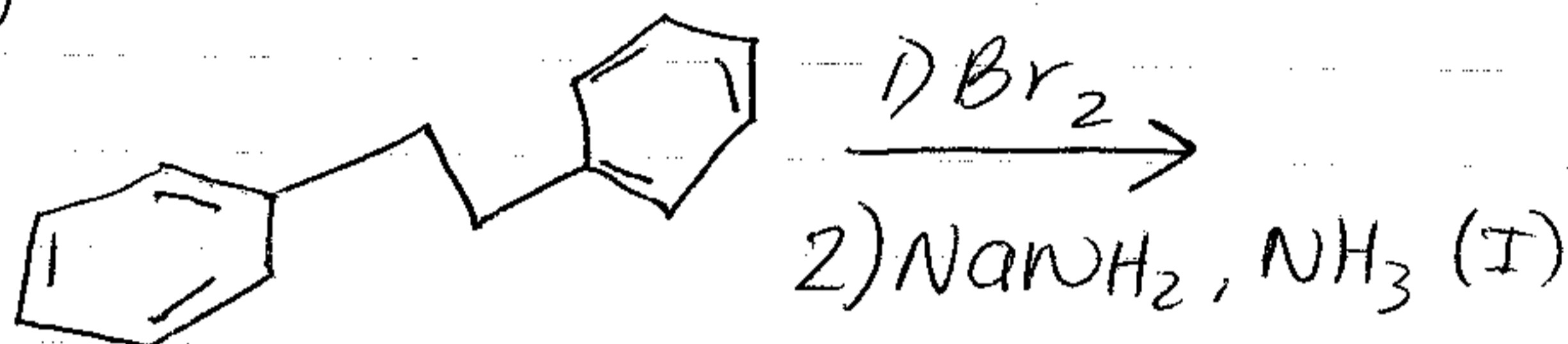
a. NaNH<sub>2</sub>, Br<sub>2</sub>

b. NaNH<sub>2</sub>, 2 equivalents

c. Br<sub>2</sub>, NaNH<sub>2</sub>, 2 equivalents

d. HBr, KOH

16) Predict the product of the following reaction sequence?

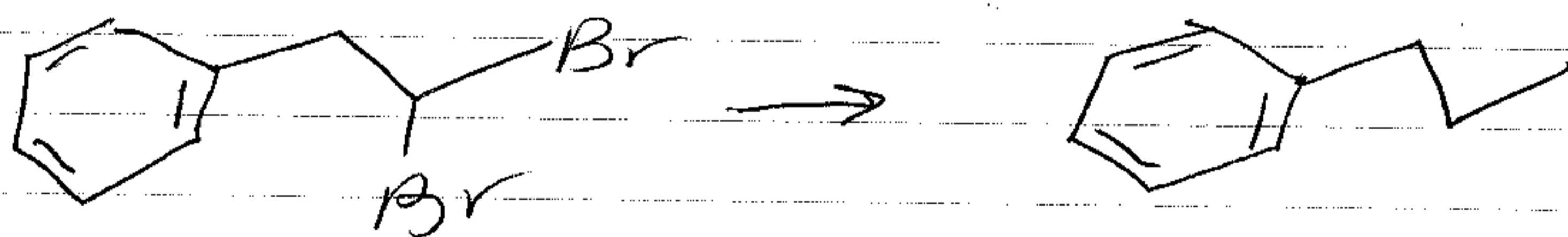


17) Name the organic starting materials that are required for the synthesis of 2-methyl-3-hexyne?

c) 3-methyl-1-pentyne, ethyl bromide

d) 3-methyl-1-butyne, 1-bromopentane

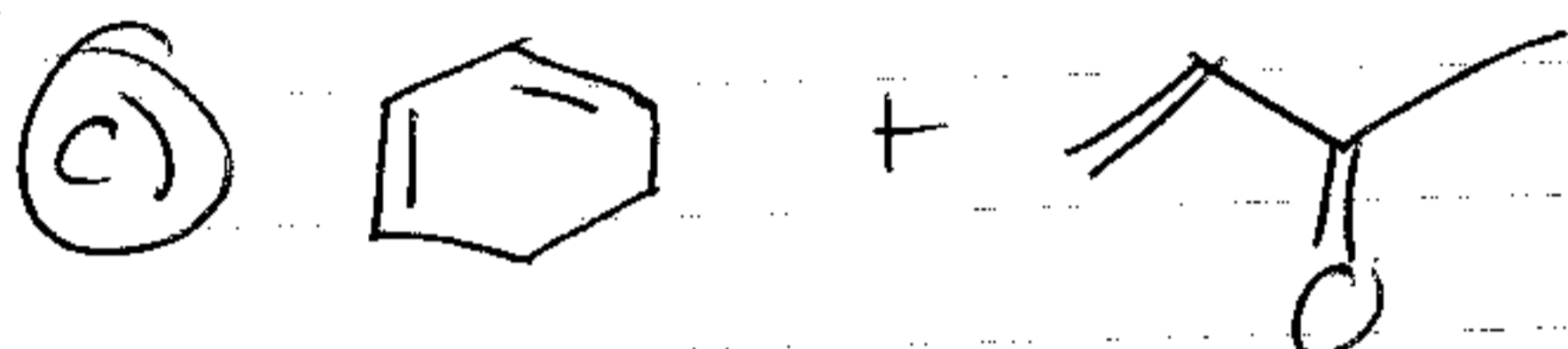
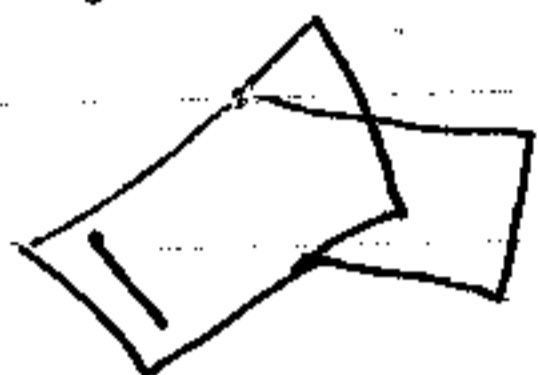
18) How would you accomplish the following synthesis?



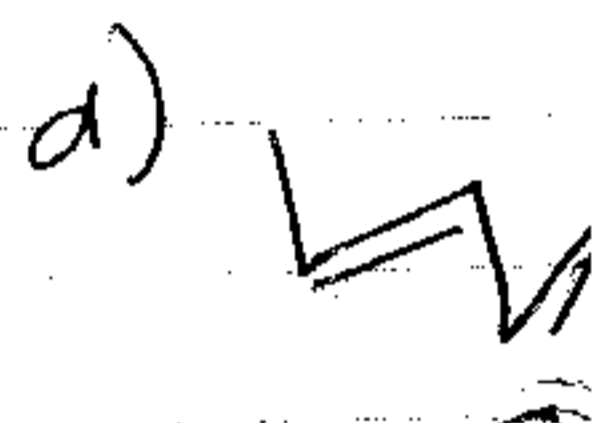
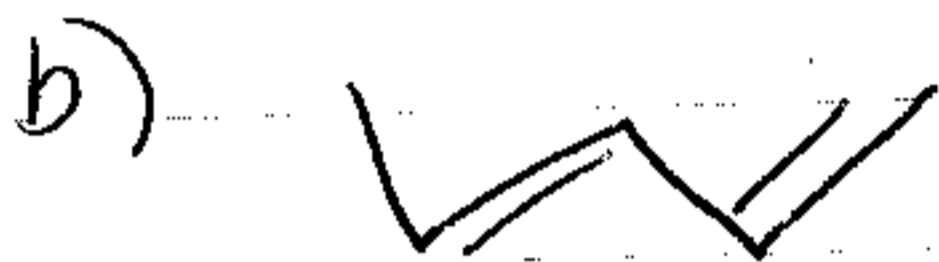
b.) a)  $3 \text{NaNH}_2$ , mineral oil, heat  
b)  $\text{MeBr}$ , DME

d. a)  $\text{KOH}$ , water  
b)  $\text{H}_2$ , Pd.

19) What are the 2 components needed to form the following Diels Alder adduct?

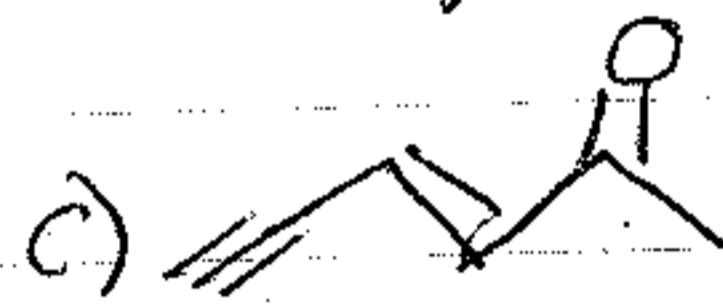
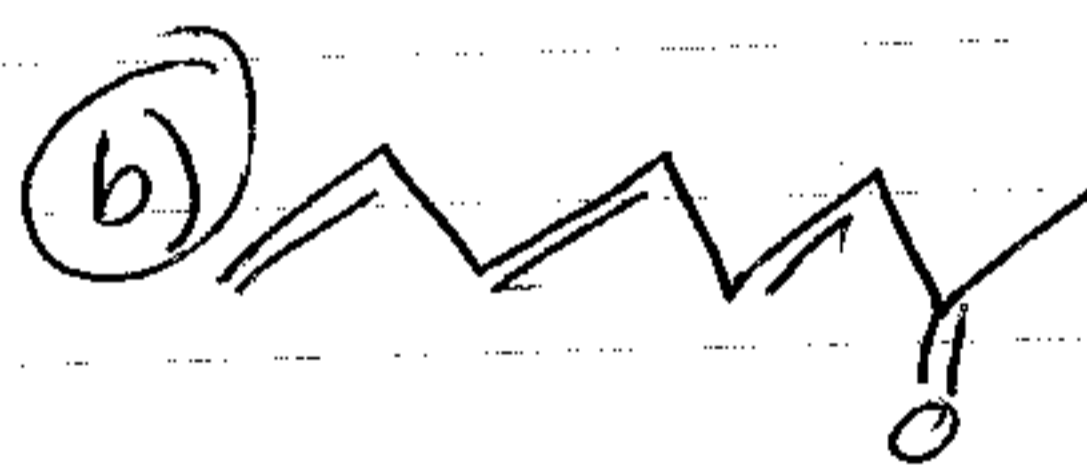
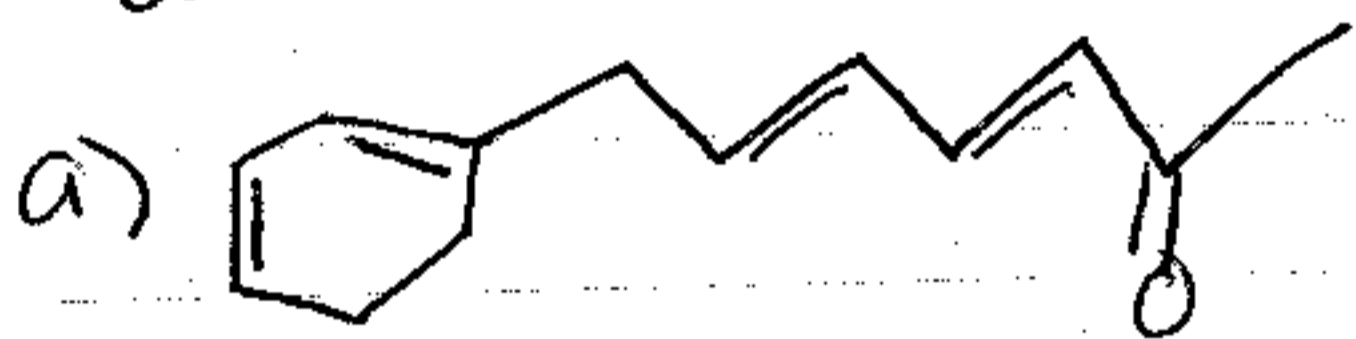


20) Rank these dienes in decreasing reactivity order



c)  $A > D > B > C$

21) Which compound will have the highest wavelength absorption



22) Which of the following is not a resonance structure of the other?

