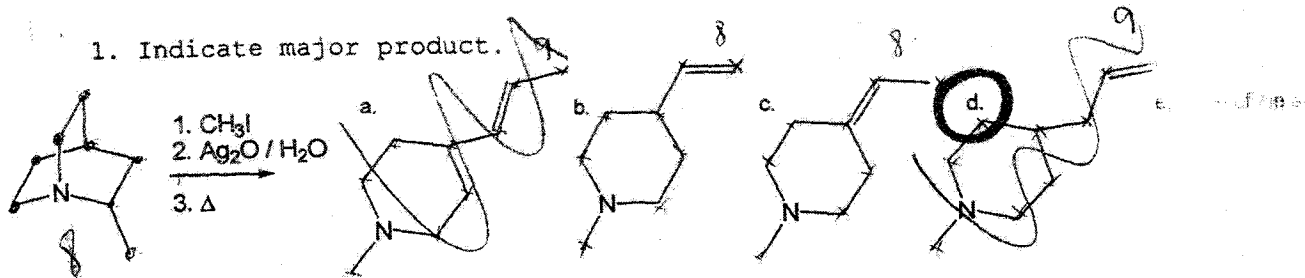


Test 3

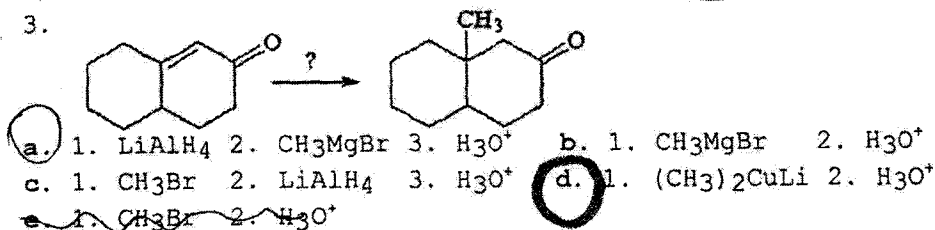
1. Indicate major product.



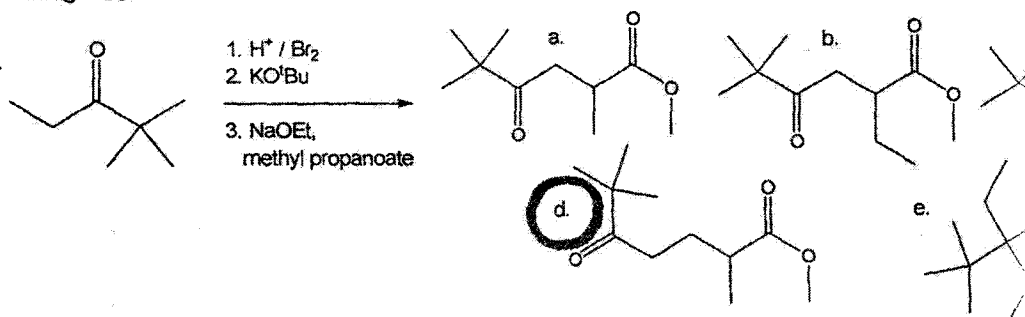
2. Given the molecular formula of a hydrocarbon which yields only the compound 3-methyl-2,4-pentanedione (shown at right) upon ozonolysis (reductive or oxidative).

- a. C_6H_{12} b. C_6H_{10} c. $C_{12}H_{22}$ d. $C_{12}H_{20}$ e. more than one of the above

3.



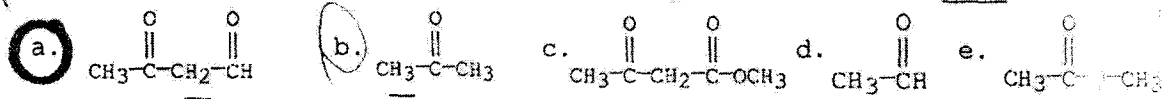
4.



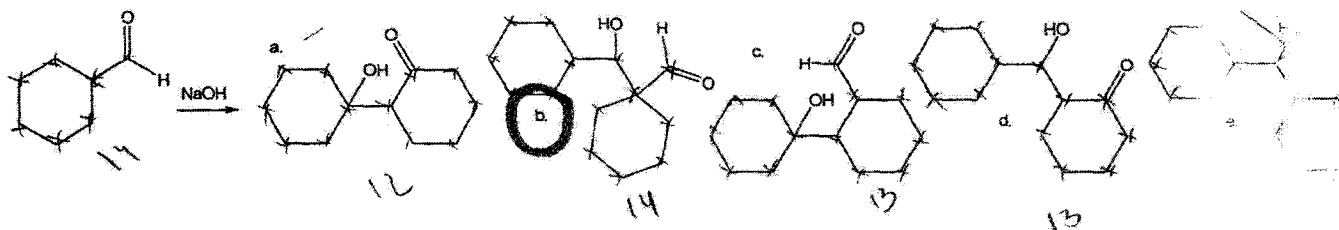
5. Which alkyl halide and ketone or aldehyde would be best suited to preparing the compound at right via a Wittig reaction and what other reagents would you need?

- a. bromocyclohexane, propanal, triphenylphosphine, butyllithium
 b. cyclohexanone, 1-bromopropane, phosphorus tribromide, sodium ethoxide
 c. cyclohexanone, 1-bromopropane, triphenylphosphine, butyllithium
 d. bromocyclohexane, propanal, phosphorus tribromide, sodium hydroxide
 e. cyclohexanone, 2-bromopropane, triphenylphosphine, butyllithium

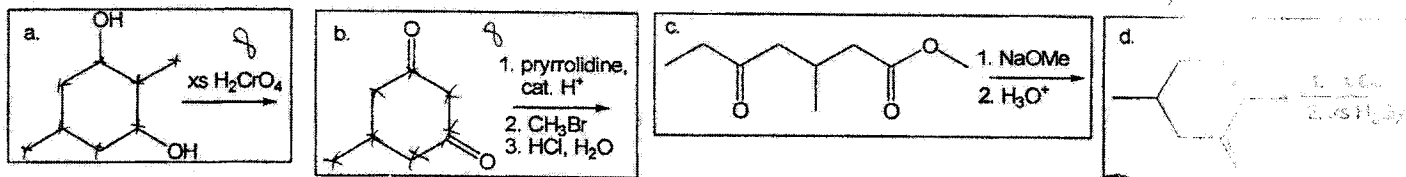
6. Which of the following underlined α -hydrogens are the most acidic?



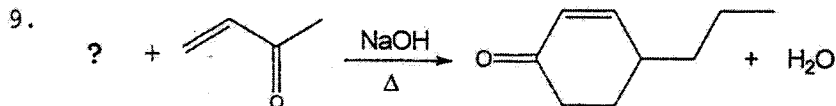
7.



8. What is a valid method of making the compound at right?

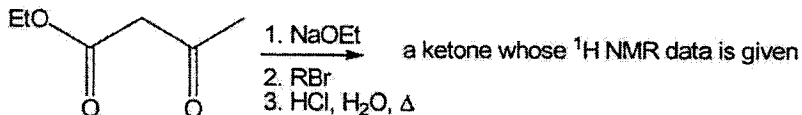


e. All of the above



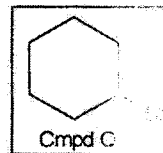
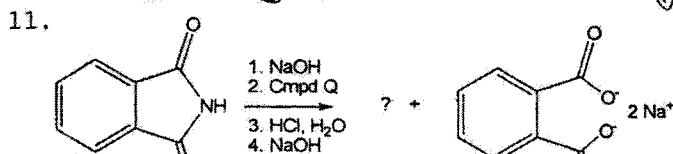
- a. 1-bromopropane b. cyclohexanone
 c. cyclohexenone (the α, β -unsaturated version of cyclohexanone)
d. pentanal e. 1-pentene

10. What alkyl halide was used in this synthesis?



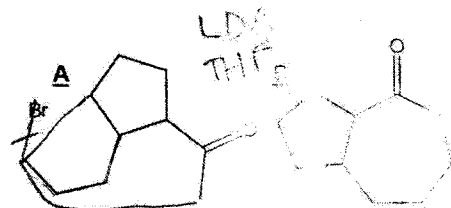
³H
 $\delta 0.9$ (2H, triplet); $\delta 1.4$ (2H, mult.); $\delta 1.6$ (2H, mult.);
 $\delta 2.1$ (3H, singlet); $\delta 2.4$ (2H, triplet)

- a. ~~1-bromopropane~~ **b. 1-bromopropane** c. 2-bromopropane
 d. 1-bromobutane e. 2-bromobutane



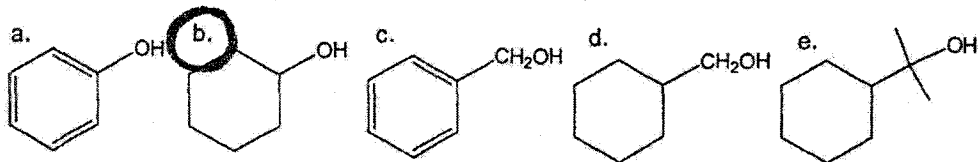
- a. b. **c.** d. e.

12. Treating compound A with LDA in THF at -78°C produces compound B. Treating A with KH at 25°C would produce what as the major product?

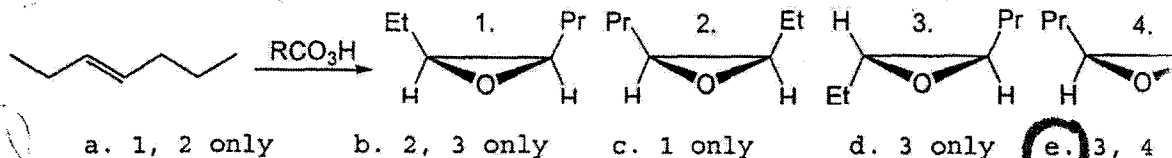


- a. b. **c.** d. e.

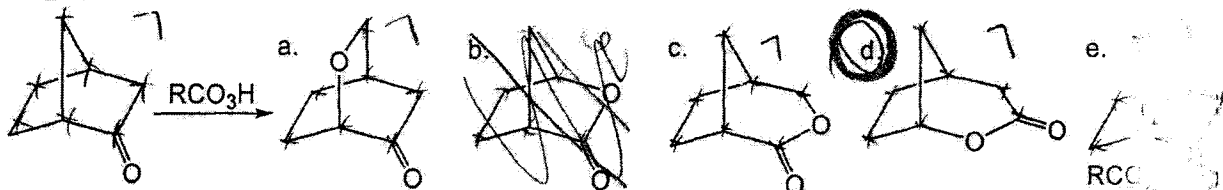
13. Which of the following is oxidized to a ketone by chromic acid?



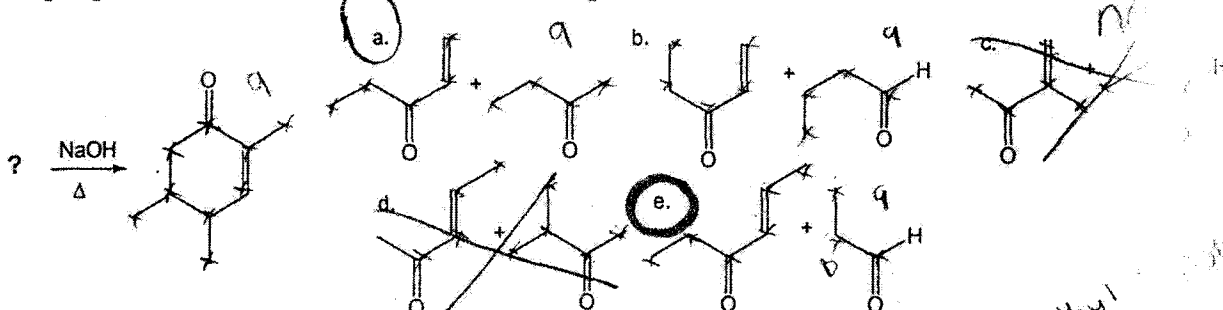
14.



15.

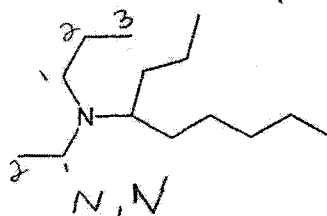


16. Which pair of compounds is best suited to preparing the Robinson annulation product below?



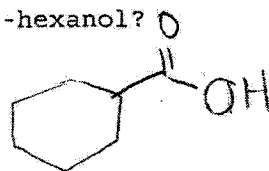
17. Name the following compound (IUPAC):

- a. ~~N-methyl-N-propyl-3-nonanamine~~
- b. ~~N-propyl-N-ethyl-4-nonanamine~~
- c. **N-ethyl-N-propyl-4-nonanamine**
- d. ~~N,N-dipropyl-3-nonanamine~~
- e. freestylamine

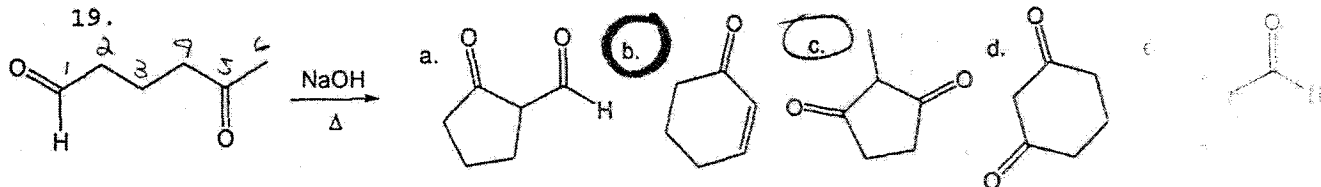


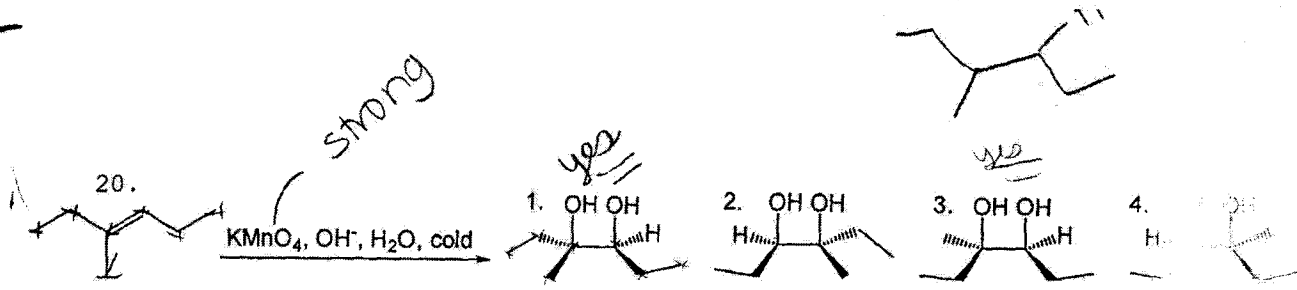
18. How would one prepare pure 1-hexanamine from 1-hexanol?

- a. 1. PBr₃ 2. NH₃
- b. NaNH₂
- c. 1. H₂CrO₄ 2. NH₃, catalytic H⁺
- d. **1. PBr₃ 2. NaCN 3. H₂, Pd/C**
- e. 1. PCC, CH₂Cl₂ 2. xs NH₃ with H₂, Pd/C



19.

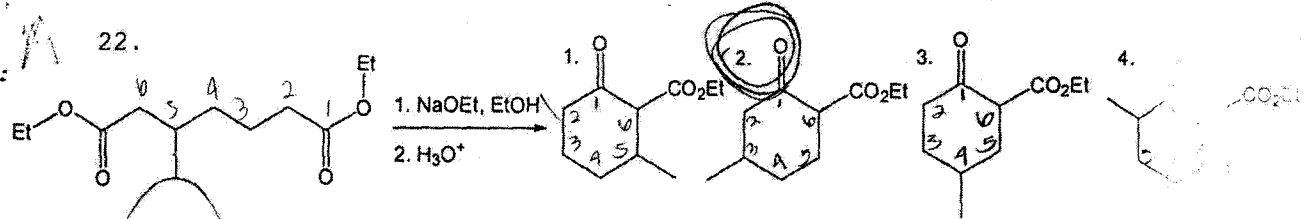




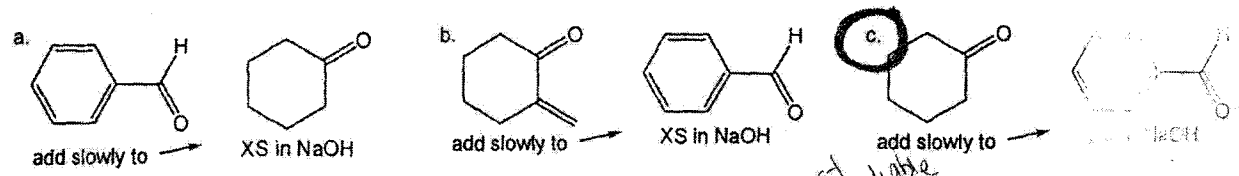
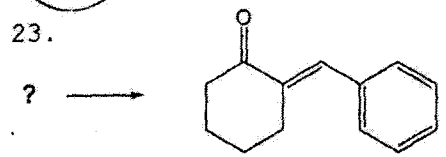
- a. 1, 2 b. 2, 3 c. 3, 4 d. 1, 4 e. 1, 2, 3, 4

21. Treatment of propanone with sodium borohydride followed by acidification yields one organic products while treatment of 2-butanone with the same sequence of reagents yields two. Why is this the case?

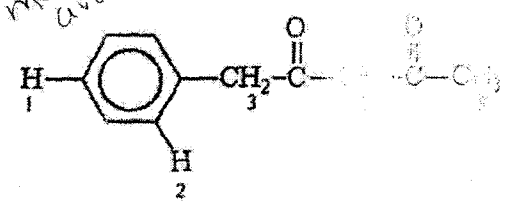
- a. a chiral center is created in the case of 2-butanone
 b. the approaching nucleophile sees two faces in the case of 2-butanone but only one face in the case of propanone
 c. no chiral center is created in the case of propanone
 d. a racemic mixture is created in the case of 2-butanone
 e. all of the above



- a. 1, 2 b. 2, 3 c. 3, 4 d. 1, 4 e. 2, 4



24. Which of the labeled hydrogen atoms in the following structure is the most acidic?



- a. 1 b. 2 c. 3 d. 4 e. 5

25. Treatment of 3,3-dimethyl-2-pentanone with a combination of excess NaOH and excess Br₂ results in:

- a. an alcohol
 b. an α -halogenated ketone
 c. a carboxylate anion plus CHBr₃ ("bromoform")
 d. an alkene
 e. an "aldol" product (aldehyde-alcohol)