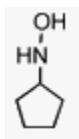
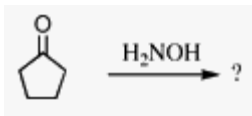
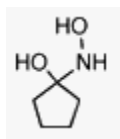


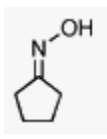
1. Aldehydes and ketones react readily with hydroxylamine (and certain other primary amines) to yield what product?



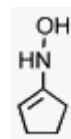
A



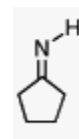
B



C

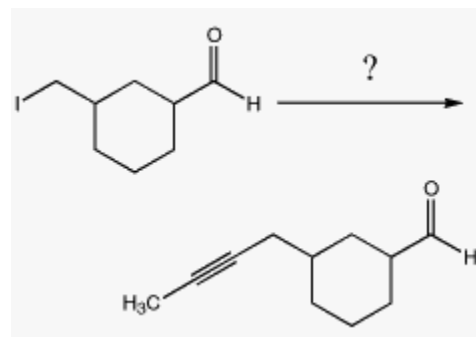
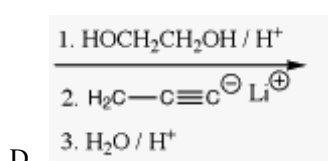
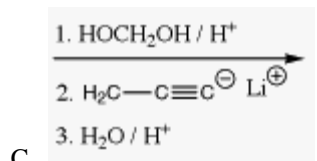
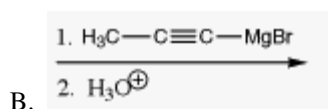
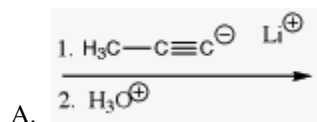


D



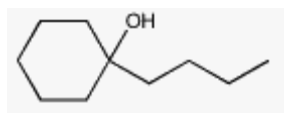
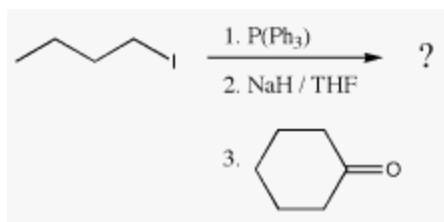
E

2. What set of reaction conditions is necessary in order to effect the following transformation?

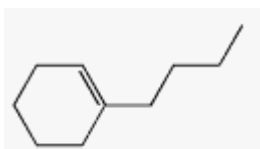


- E. Two of these sets of reaction conditions are correct. Which ones?

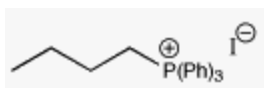
3. Predict the major product of the following reaction.



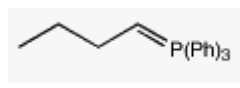
A



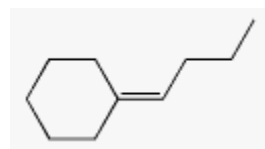
B



C



D



E

4. What reagents would allow you to accomplish the conversion of C=O to CH₂?

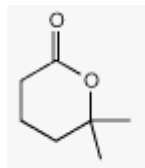
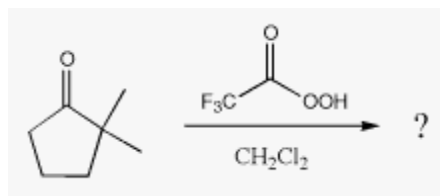
A. NaBH₄/CH₃OH

B. Zn(Hg)/ aq. HCl

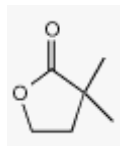
C. H₂/PtD. H₂NNH₂, KOH, Δ

E. More than one of the above. Which ones?

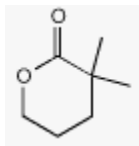
5. What is the major product of the following reaction?



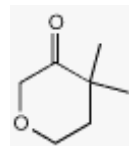
A



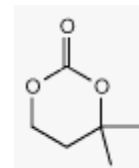
B



C

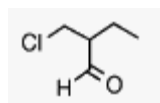


D



E

6. How would you name the following molecule?



A. 1-chloro-2-butanealdehyde

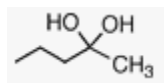
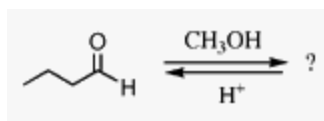
B. 2-(chloromethyl)butanal

C. 3-chloro-2-ethylpropanal

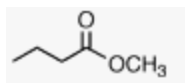
D. 4-chloro-4-oxobutane

E. 1-chloro-2-formylbutane

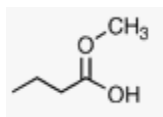
7. What product do you expect from the reaction shown?



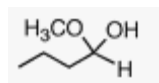
A



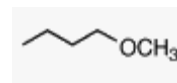
B



C

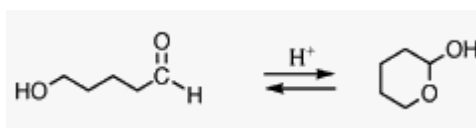


D



E

8. To which side, if any, would the following equilibrium lie?



A. To the right.

B. To the left.

C. Equally to the right and left.

D. There is no way to predict this.

E. This reaction cannot occur.

9. Which of the following combinations is correct? Aldehydes

I are more reactive than ketones toward nucleophiles.

II are more easily oxidized than ketones.

III are less reactive than ketones toward nucleophiles.

IV are less easily oxidized than ketones.

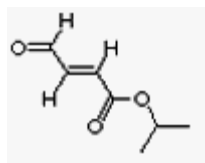
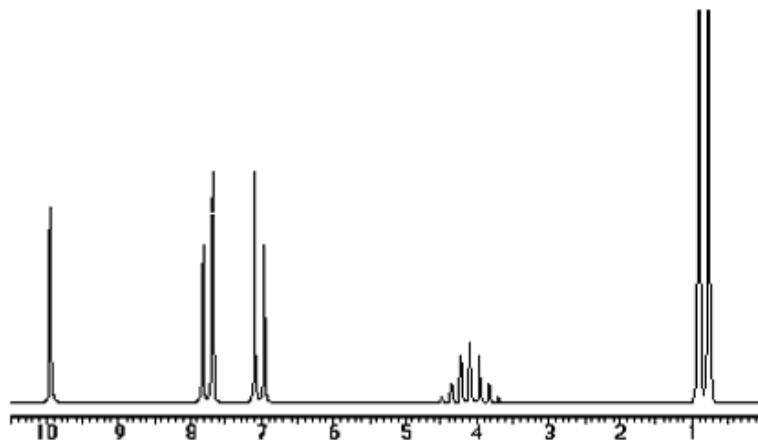
A. **I** and **II**

B. **III** and **IV**

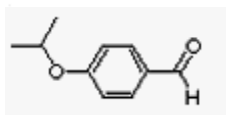
C. **I** and **IV**

D. **II** and **III**

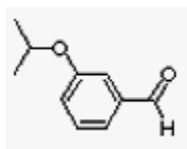
10. Which of the following compounds most likely generated the accompanying ^1H -NMR-spectrum?



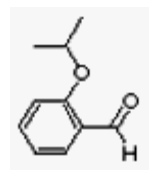
A



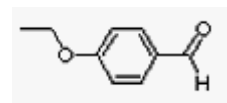
B



C



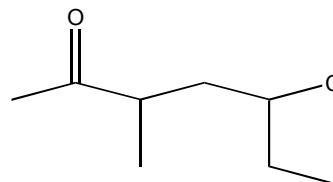
D



E

11. The IUPAC name of the compound shown on the right is

- A. 1-chloro-1,3-dimethyl-4-pentanone
- B. 5-chloro-3-methyl-2-heptanone
- C. 5-chloro-3,5-dimethyl-2-hexanone
- D. 3-chloro-5-methyl-6-heptanone



12. Which of the compounds listed below would you expect to have the highest boiling point? (They all have approximately the same molecular weight.)

- A. $\text{CH}_3(\text{CH}_2)_3\text{CH}_3$
- B. $\text{CH}_3(\text{CH}_2)_2\text{CH}_2\text{OH}$
- C. $(\text{C}_2\text{H}_5)_2\text{O}$
- D. $\text{CH}_3(\text{CH}_2)_2\text{CHO}$
- E. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{F}$

13. Which of the following reagents **CANNOT** be used to distinguish between butanal and 2-butanone?

- A. $\text{Ag}_2\text{O}/\text{OH}^-$
- B. $\text{Cr}_2\text{O}_7^{2-}/\text{H}^+$
- C. Cu^{2+}
- D. NaBH_4

14. The reaction on the right produces a(n) _____.



- A. optically active compound
- B. racemic pair
- C. *meso* compound
- D. a pair of diastereomers

15. Which of the following compounds would **NOT** undergo a Cannizzaro reaction?

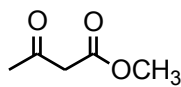
- A. $(\text{CH}_3)_3\text{CCHO}$
- B. HCHO
- C. $\text{O}_2\text{N}-\text{C}_6\text{H}_4-\text{CHO}$
- D. CH_3CHO

16. A correct name for $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{CH}(\text{O})\text{CH}_3$ is?

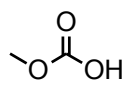
- A. 3-Benzylpropanone
- B. 3-Phenylpropanal
- C. 3-Benzylpropanal
- D. Nonanone
- E. Nonanal

17. Which of the following compounds is an acetal?

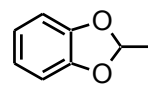
- A. I
B. II
C. III
D. IV
E. None of these



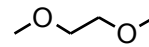
I



II

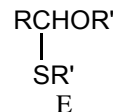
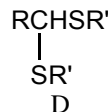
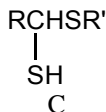
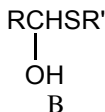
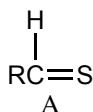


III

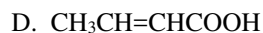
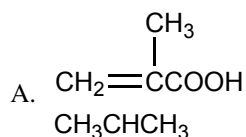
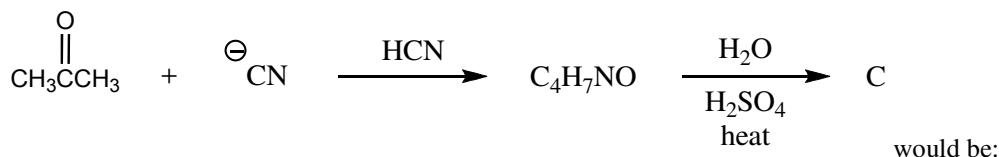


IV

18. Which is the general formula for a thioacetal?



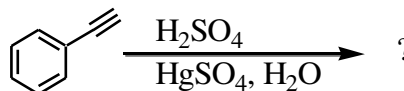
19. The product, C, of the following reaction sequence,



E. None of these

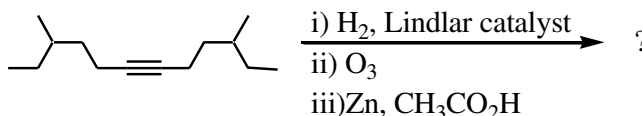
20. Select the structure of the major product in the following reaction.

- A. Ethylbenzene
B. 1-Phenylethanol
C. Acetophenone
D. 2-Phenylethanal
E. Vinylbenzene



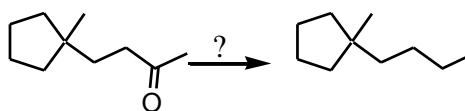
21. Select the structure of the major product in the following reaction.

- A. 4-methylhexanal
B. 4-methyl-1-hexanol
C. 3-methylhexanal
D. 4,10-dimethyldodecane-6,7-dione
E. 4,10-dimethyldodecane-6,7-diol



22. The following reduction can be carried out with which reagent(s)?

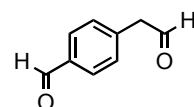
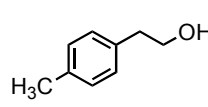
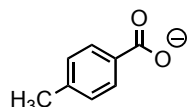
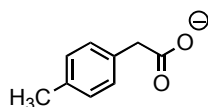
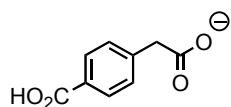
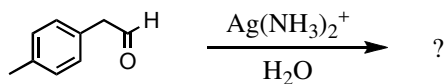
- A. $\text{Zn}(\text{Hg})$, HCl
B. i) $\text{HSCH}_2\text{CH}_2\text{SH}$, BF_3 ; ii) Raney Ni (H_2)
C. NaBH_4 , CH_3OH
D. A & B
E. A & C



23. An aldehyde results from the reaction of which of these compounds with aqueous base?

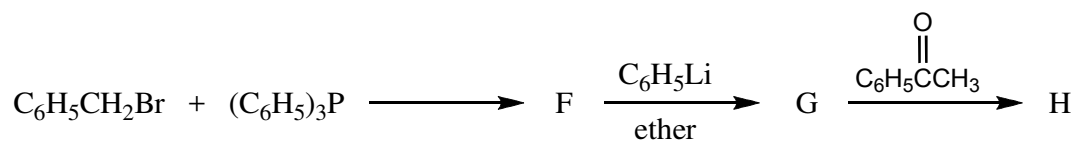
- A. $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$ B. $\text{CH}_3\text{CHClCH}_2\text{Cl}$ C. $\text{CH}_3\text{CH}=\text{CCl}_2$ D. $\text{CH}_3\text{CH}_2\text{CHCl}_2$ E. $\text{CH}_3\text{CCl}_2\text{CH}_3$

24. Predict the major organic product of the following reaction:



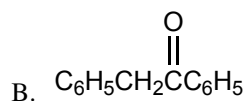
- A. I B. II C. III D. IV E. V

25. The product, H, of the following reaction sequence,



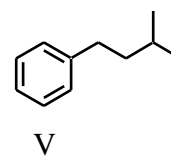
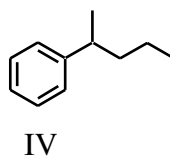
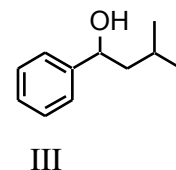
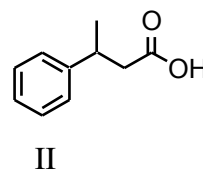
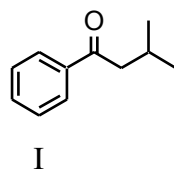
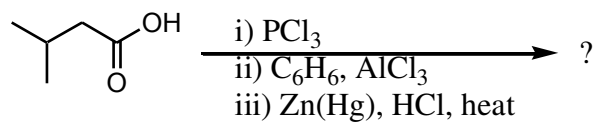
would be:

- A.
- C.
- E.



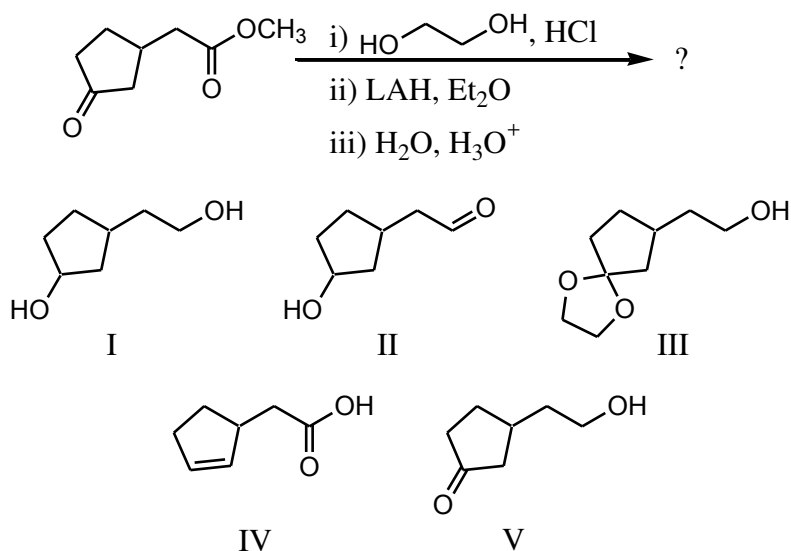
26. What would be the product of the following reaction sequence?

- A. I
B. II
C. III
D. IV
E. V



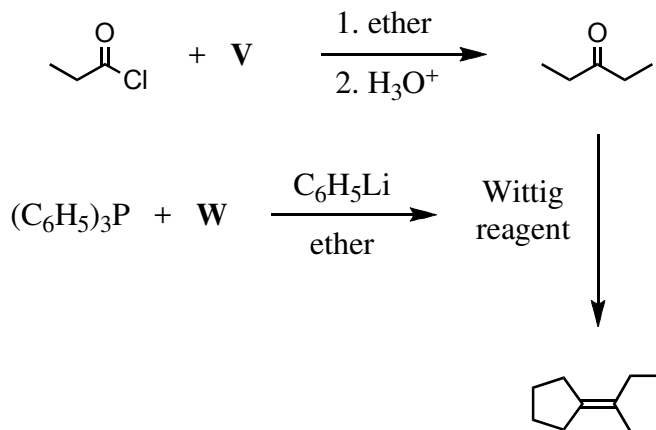
27. What is the major product of the following reaction sequence?

- A. I
- B. II
- C. III
- D. IV
- E. V

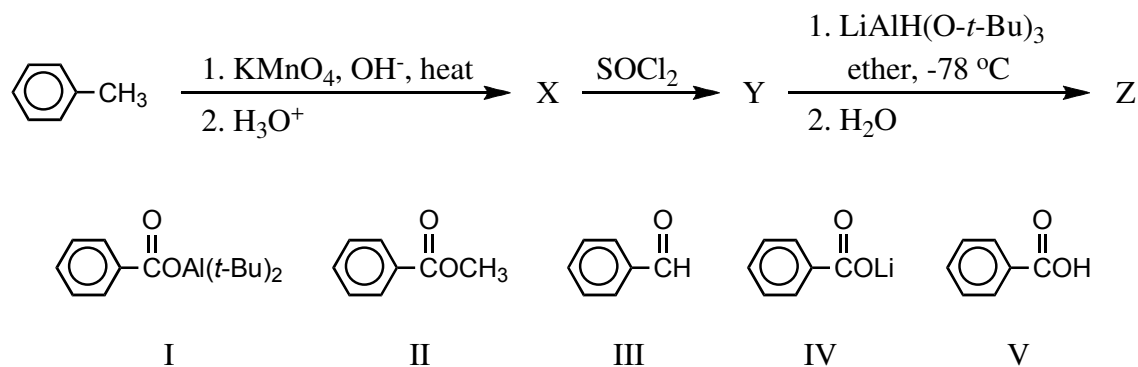


28. What is the reactant W in the synthesis given below?

- A. cyclopentanone
- B. cyclopentene
- C. cyclopentanol
- D. bromocyclopentane
- E. triphenylphosphine oxide



29. What is the final product, Z, of the following synthesis?



- A. I
- B. II
- C. III
- D. IV
- E. V

30. Which of the reactions listed below would serve as a synthesis of acetophenone, $\text{C}_6\text{H}_5\text{C}(=\text{O})\text{CH}_3$?

- A. $\text{C}_6\text{H}_5\text{COCl} + (\text{CH}_3)_2\text{CuLi} \longrightarrow$
- B. $\text{C}_6\text{H}_6 + \text{CH}_3\text{COCl} \xrightarrow{\text{AlCl}_3}$
- C. $\text{C}_6\text{H}_5\text{CN} + \text{CH}_3\text{Li} \xrightarrow{\text{ether}} \xrightarrow{\text{H}_3\text{O}^+}$
- D. Answers A) and B) only
- E. Answers A), B), and C)

31. The ^1H NMR spectrum of a compound with formula $\text{C}_7\text{H}_{14}\text{O}$ gives a doublet at 9.2 ppm. Which of these structures is a possible one for this compound?

- A. 2-methyl-3-hexanone
- B. 2-methylhexanal
- C. 2,2-dimethylpentanal
- D. 2,2-dimethyl-3-pentanone
- E. two of the above; which ones?

32. The ^{13}C NMR spectrum of a compound with formula $\text{C}_7\text{H}_{14}\text{O}$ gives three signals. Which of these structures is a possible one for this compound?

- A. 2-heptanone
- B. 3-heptanone
- C. 2,2-dimethyl-3-pentanone
- D. 2,4-dimethyl-3-pentanone
- E. two of the above; which ones?

33. Stereoisomers can exist in the case of which of the following?

- A. The hydrazone of butanone
- B. The oxime of acetone
- C. The phenylhydrazone of cyclohexanone
- D. The cyclic acetal formed from propanal and ethane-1,2-diol
- E. The imine of cyclopentanone

34. How could the following synthetic conversion be accomplished?

- A. $\text{HgSO}_4/\text{H}_2\text{SO}_4$; then $\text{PCl}_5/0^\circ\text{C}$; then NaNH_2 , liq. NH_3
- B. $\text{PCl}_5/0^\circ\text{C}$; then NaNH_2 , liq. NH_3 ; then SiA_2BH ; then H_2O_2
- C. $\text{PCl}_5/0^\circ\text{C}$; then NaNH_2 , liq. NH_3 ; then HgSO_4 , $\text{H}_2\text{SO}_4/\text{H}_2\text{O}$
- D. NaNH_2 , liq. NH_3 ; then $\text{PCl}_5/0^\circ\text{C}$; then HgSO_4 , $\text{H}_2\text{SO}_4/\text{H}_2\text{O}$
- E. H_2O_2 ; then $\text{PCl}_5/0^\circ\text{C}$; then NaNH_2 , liq. NH_3 ; then SiA_2BH



NAME _____

DATE _____

ANSWER SHEET
CHE 325 – CHAP 17 ASSIGN

- | | | | |
|-----------|-----------|-----------|-----------|
| 1. _____ | 13. _____ | 25. _____ | 37. _____ |
| 2. _____ | 14. _____ | 26. _____ | 38. _____ |
| 3. _____ | 15. _____ | 27. _____ | 39. _____ |
| 4. _____ | 16. _____ | 28. _____ | 40. _____ |
| 5. _____ | 17. _____ | 29. _____ | 41. _____ |
| 6. _____ | 18. _____ | 30. _____ | 42. _____ |
| 7. _____ | 19. _____ | 31. _____ | 43. _____ |
| 8. _____ | 20. _____ | 32. _____ | 44. _____ |
| 9. _____ | 21. _____ | 33. _____ | 45. _____ |
| 10. _____ | 22. _____ | 34. _____ | 46. _____ |
| 11. _____ | 23. _____ | 35. _____ | 47. _____ |
| 12. _____ | 24. _____ | 36. _____ | 48. _____ |

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