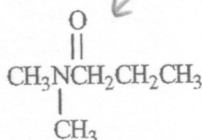


Instructions: Tell which spectroscopic technique you would use to distinguish between the two members of the pair. Tell what differences you would expect to see. Be specific

9. Identify spectroscopic technique: IR



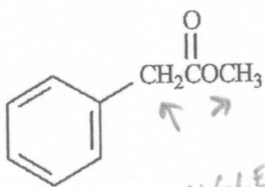
and



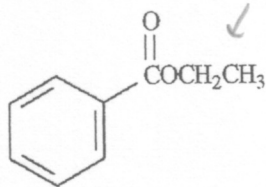
↑
2200
IR

← 1640 IR

10. Identify spectroscopic technique: NMR



and

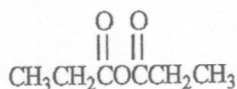


↑ ↑
SINGLET

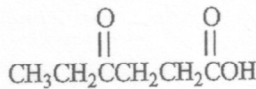
↓ ETHYL PATTERN



11. Identify spectroscopic technique: IR

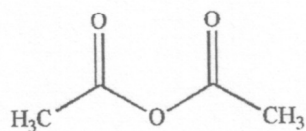


and

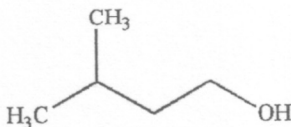


↑ 3000 BROAD

12. The product of the following reaction is a primary essence contained within bananas.

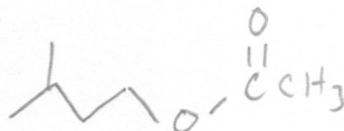


+

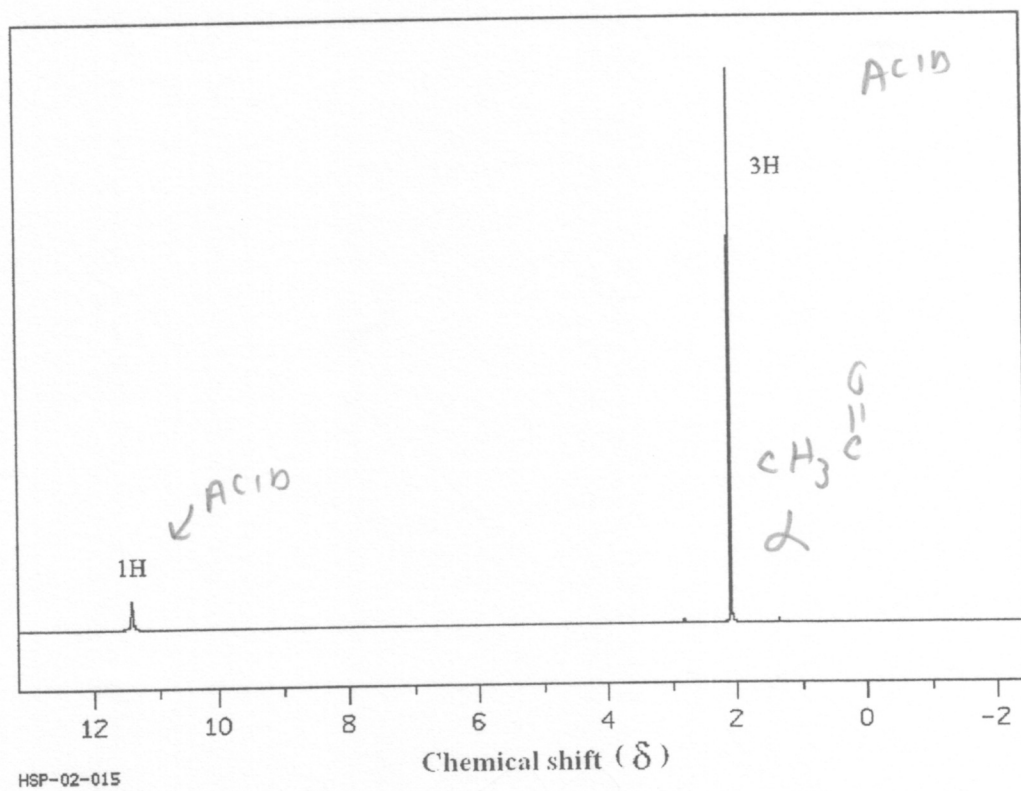
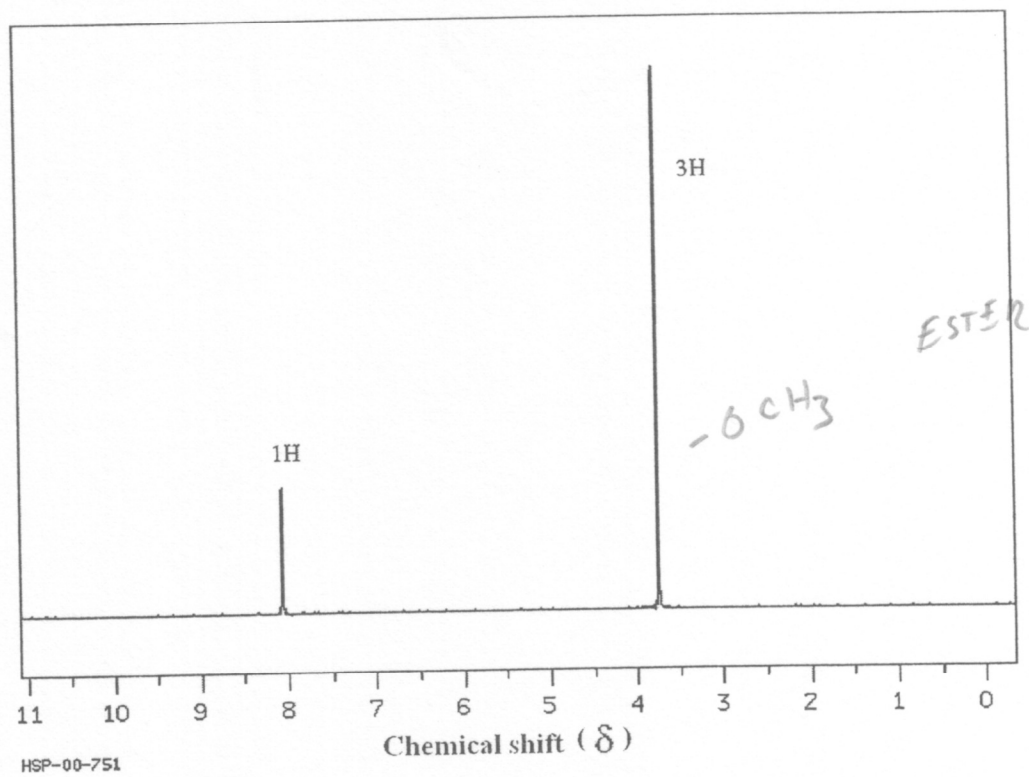


pyridine, heat

Draw its structure.

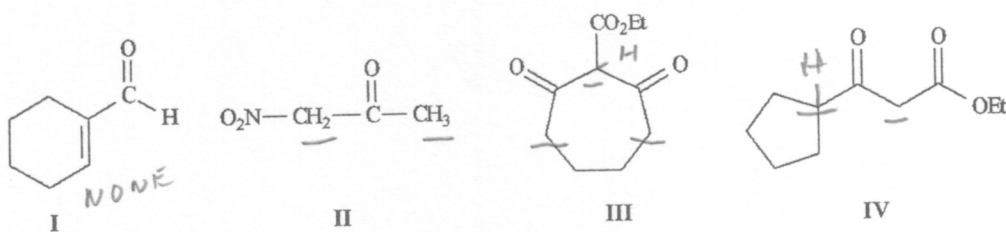


13. The two spectra below belong to acetic acid (ethanoic acid) and its isomer, methyl formate (methyl methanoate). Which spectrum corresponds to which compound? Explain your answer.

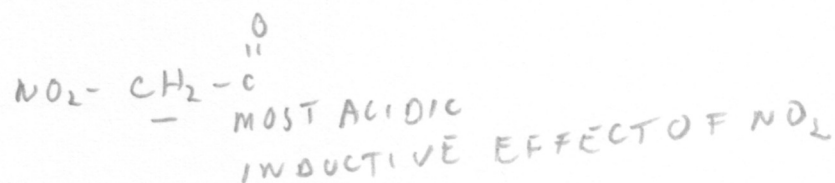


(Spectra obtained from SDBSWeb: <http://www.aist.go.jp/RIODB/SDBS>)

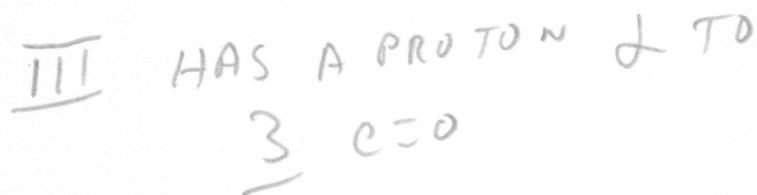
Instructions: Refer to the compounds below to answer the following question(s).



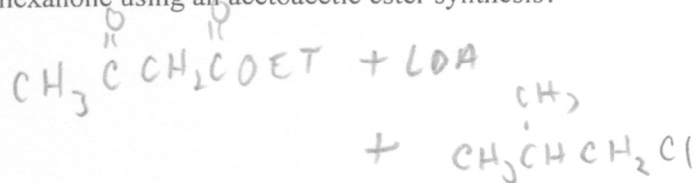
14. Refer to instructions. Underline all the acidic hydrogen atoms in Compounds **I** through **IV**.
15. Refer to instructions. Indicate which hydrogens in Compound **II** are the *most acidic*. Explain your answer.



16. Refer to instructions. Choose the *most acidic* compound from Compounds **I** – **IV**. Explain your choice.

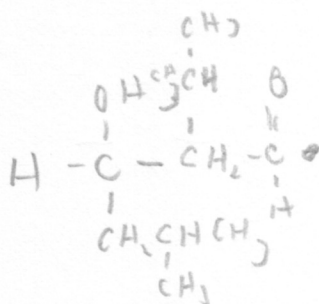
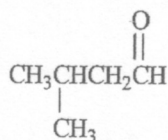


17. How would you prepare 5-methyl-2-hexanone using an acetoacetic ester synthesis?

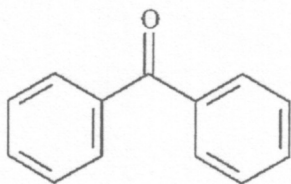


Instructions: Draw the structure of the aldol self-condensation product of each compound for the following question(s). If a compound does not undergo aldol self-condensation, explain why it does not.

18. Draw and explain:

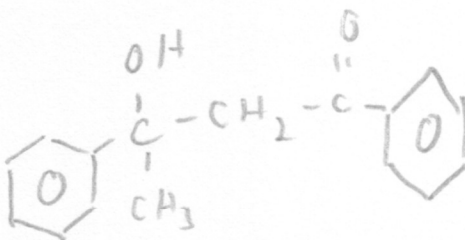
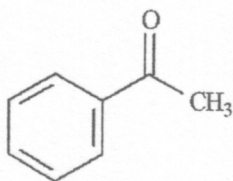


19. Draw and explain:

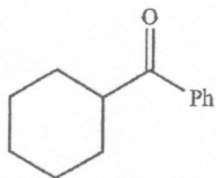


NO 2 H

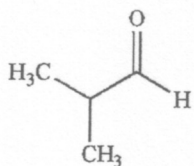
20. Draw and explain:



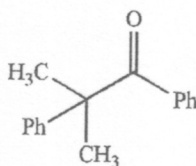
21. Which of the following does not possess an enol form? Explain your choice.



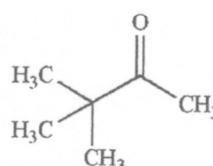
A



B



C



D

NO 2