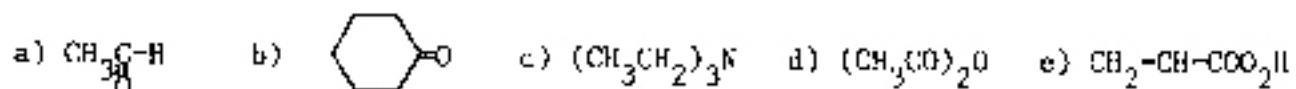


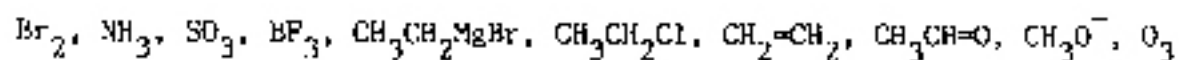
八十六學年度 原子科學 系(所) 乙 組碩士班研究生入學考試

科目 有機化學 科號 4304 共 4 頁第 1 頁 *請在試卷【答案卷】內作答

1. Give an acceptable English name (the IUPAC or common name) for each of the following compounds. (10%)



2. Which of the following molecules or ions are referred to as Lewis acids and which of them are as Lewis bases? (10%)

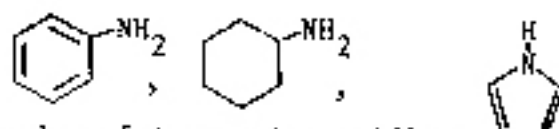


3. Draw the important resonance structures for the following ions and label the major and minor contributors and state which structures are of equal energy. (5%)

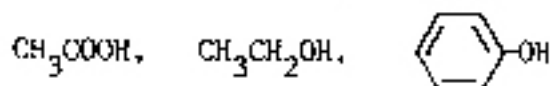


4. Rank the following compounds in each set (5%)

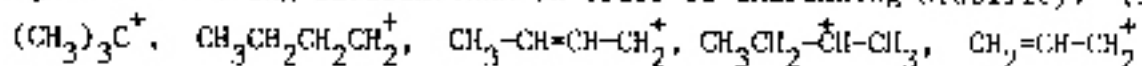
a) in order of increasing basicity.



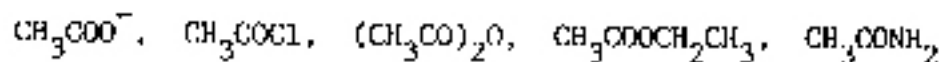
b) in order of increasing acidity.



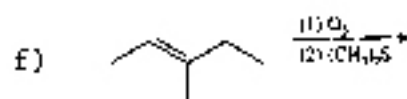
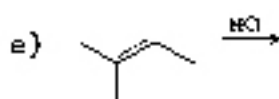
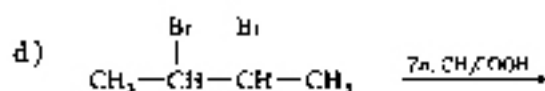
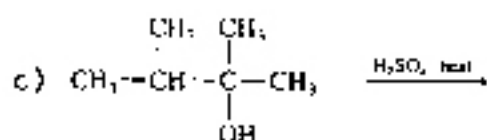
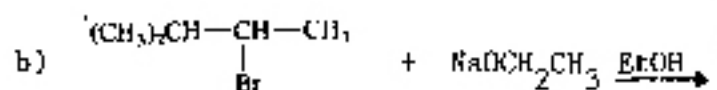
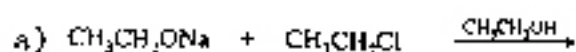
5. Arrange the following carbocations in order of increasing stability. (5%)



6. Arrange the following carboxylic acid derivatives in order of increasing reactivity toward nucleophilic attack (for example, reaction with HO^- , etc.). (5%)

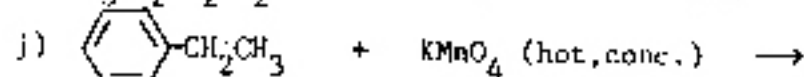
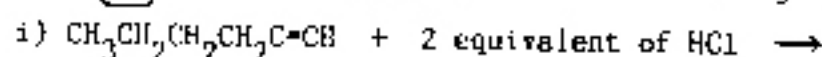
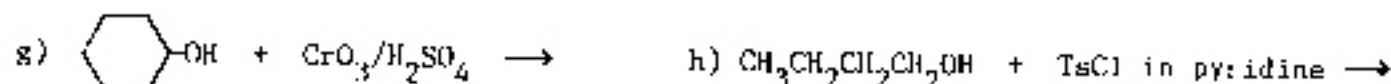


7. Predict the major products of the following reactions, including stereochemistry where appropriate. (20%)

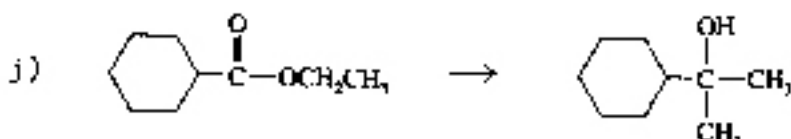
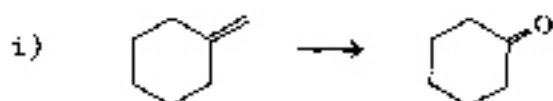
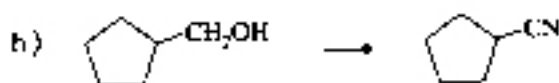
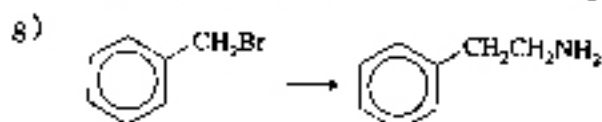
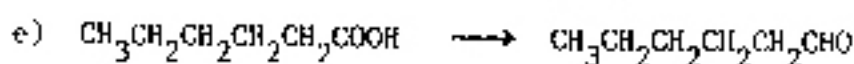
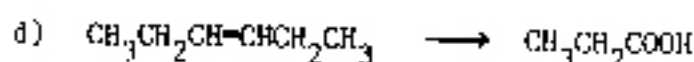
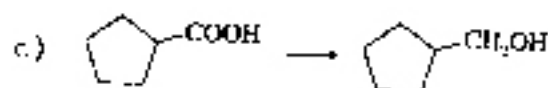
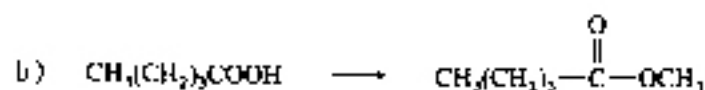
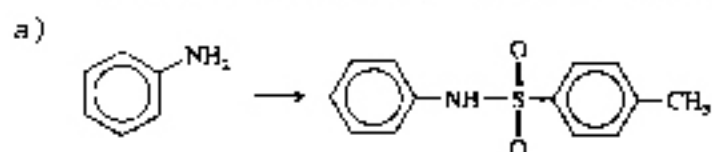


八十八學年度 原子科學 系(所) 乙 組碩士班研究生入學考試

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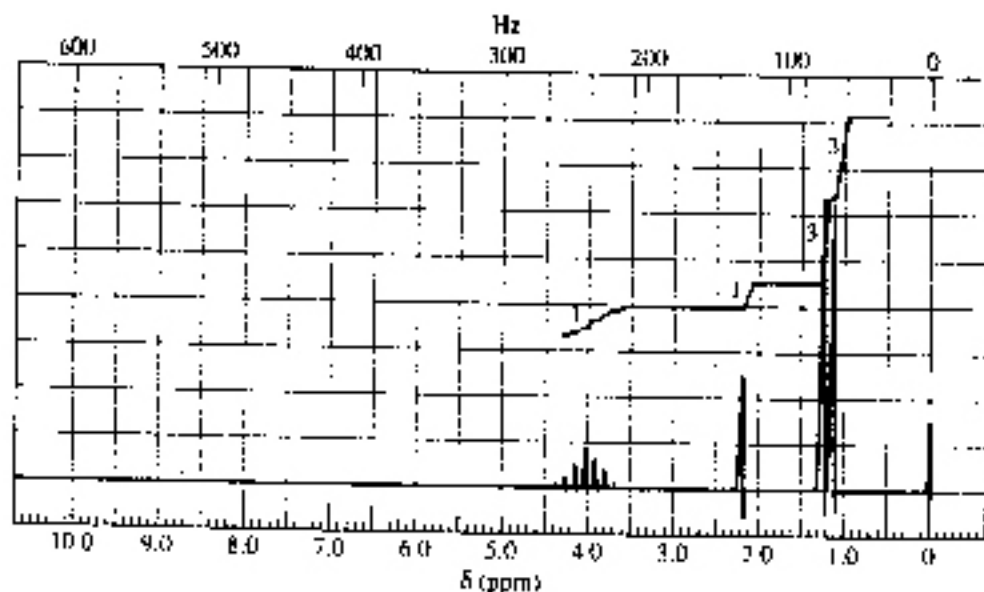


8. Show how you would accomplish the following synthetic transformations. Show the necessary reagents and reaction conditions. (20%)

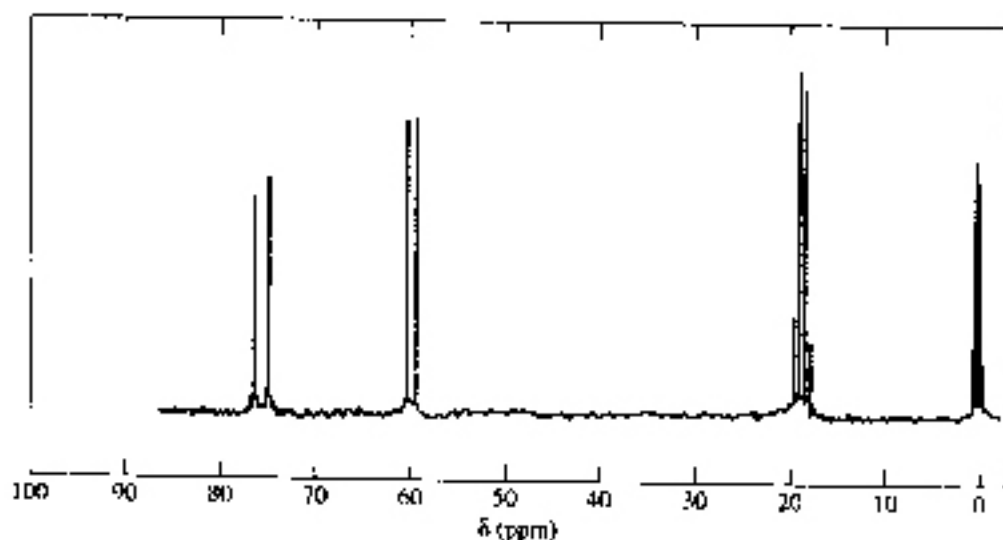


八十六學年度 原子科學 系(所) 乙 組碩士班研究生入學考試
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9. Propose a structure from the proton NMR spectrum of a compound with molecular formula C_3H_8O . Explain the spectrum in detail. (5%)



10. The following off-resonance-decoupled carbon NMR was obtained from compound of formula $C_3H_5Cl_3$. Propose a structure for this compound, and show which carbon atoms give rise to which peaks in the spectrum. (5%)



11. An unknown compound gives the mass spectrum and infrared spectrum shown below. Explain the spectra in detail and propose a possible structure for the compound. Propose structures for the major fragments at 39, 67, 81, 95 in the mass spectrum. (10%)

(continued to back page)

八十八學年度 原子科學 系(所) 23 組碩士班研究生入學考試
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