

Organic Chemistry II
CHM 2211
Sample Exam 4

I. Write structures for the compounds named below:

diisopropylamine

2,4 - dimethylaniline

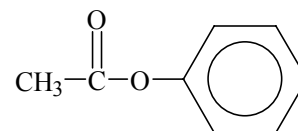
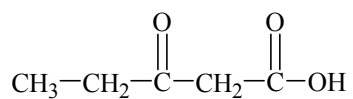
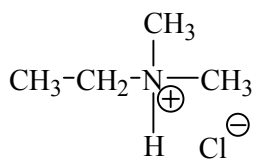
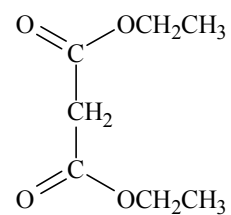
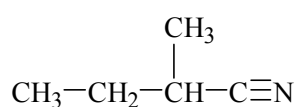
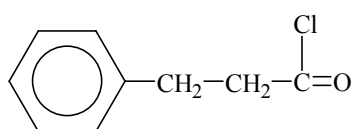
N,N,N - trimethyl-2-ethanolamine

benzylbenzoate

acetic anhydride

hexanamide

II. Name the compounds whose structures are shown below:



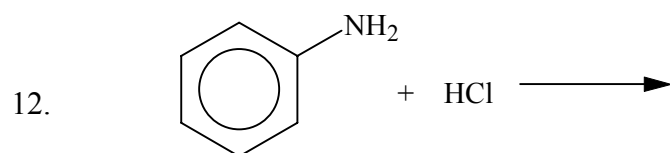
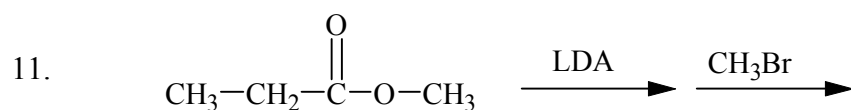
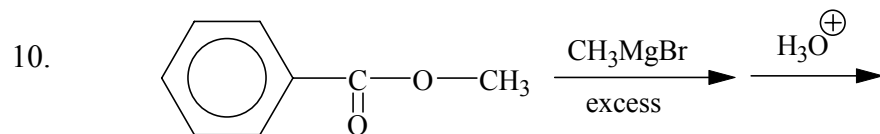
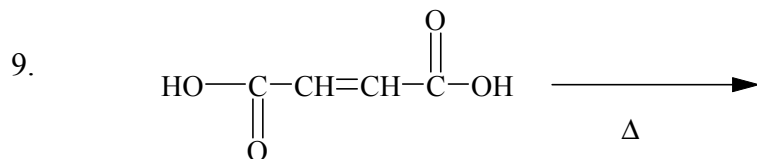
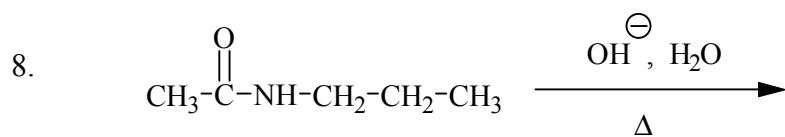
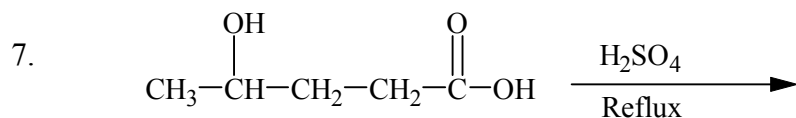
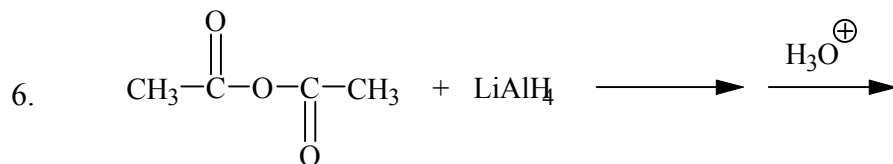
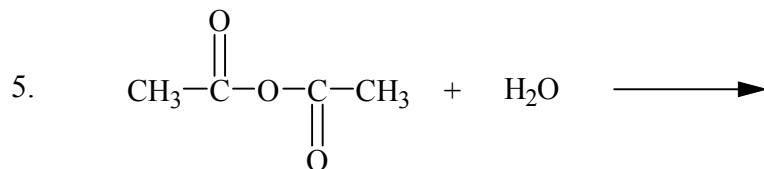
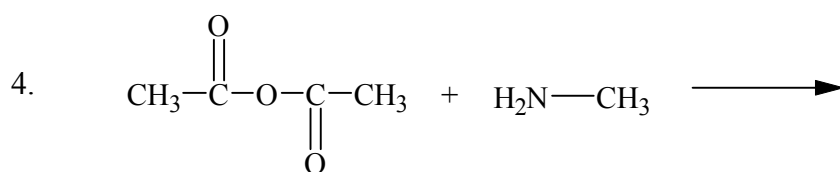
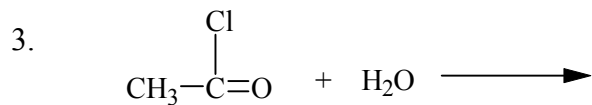
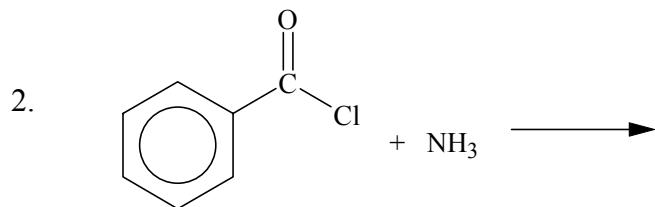
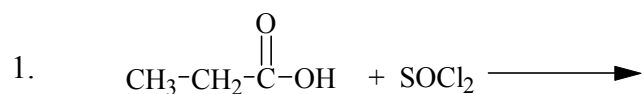
III. Fill in the Blanks

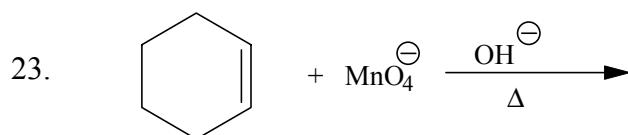
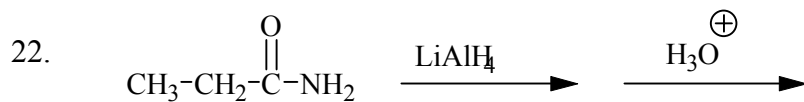
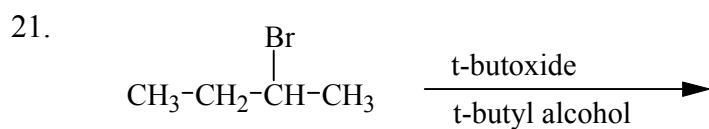
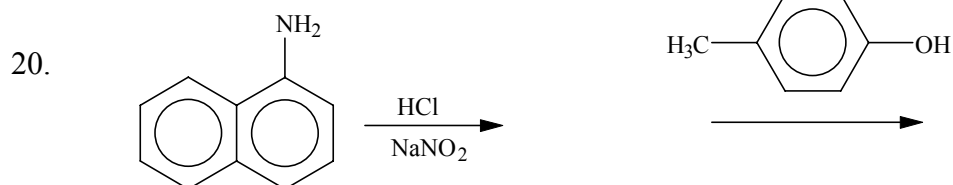
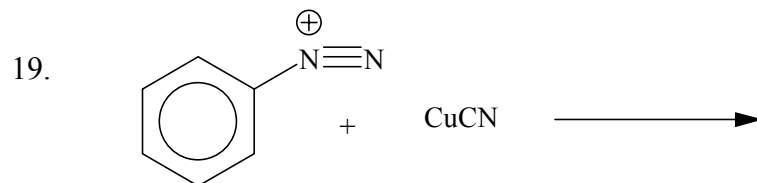
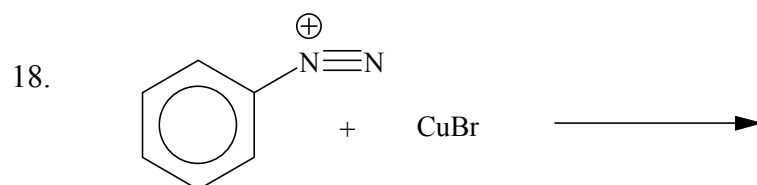
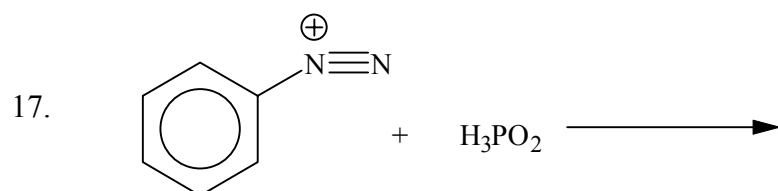
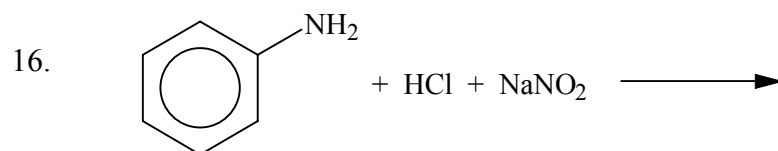
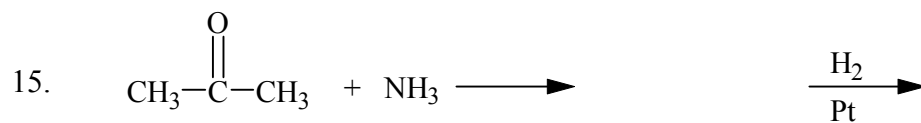
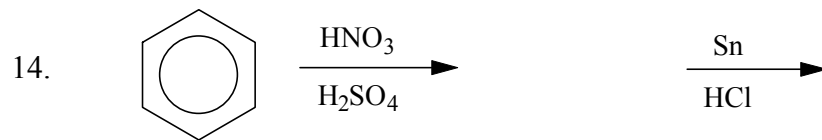
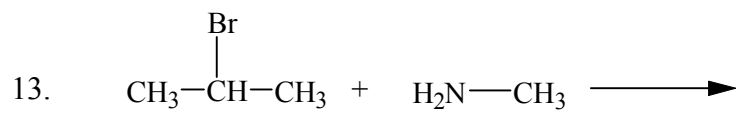
1. Which of the carboxylic acid derivatives is the most reactive? _____
2. Carcinogenic compounds that arise from the oxidation of 2° amines are called _____.
3. Malonic ester synthesis can be used to produce _____ (general type of compound).
4. Acetoacetic ester synthesis can be used to make _____ (general type of compound).
5. Direct alkylation of ketones, esters and nitriles can be carried by first reacting the compound with the strong base called _____, and then reacting the resulting alpha anion with an alkyl halide.
6. What predominate feature would you see in the IR spectrum of a primary amine? R-NH₂

7. The pK_a of an aliphatic amine is about _____.
8. Nitrites react with amines in acidic solution to yield _____ which may be carcinogenic.
9. Arenediazonium salts are highly reactive and useful in synthesis via a series of reactions called _____ reaction (name the reactions).
10. One of the first synthetic dyes was Orange II which was made using a _____ reaction.

IV. Write the mechanism for the reaction of methyl alcohol with propanoyl chloride to produce an ester. Make sure you use curved arrow notation and indicate the removal of hydrogen ions from any protonated species that may be formed during the reaction. Show ALL products of the reactions.

V. Complete the following reaction equations by filling in the missing information:





VI. Synthesis. Complete ANY TWO of the following. (If you do more than two I'll grade the first two I come to.) You know the rules, you have to show where everything but common reagents come from.

1. para-fluorobenzoic acid from aniline

2. 3-Butyl-2-heptanone using acetoacetic ester synthesis

3. 2-Ethylpentanoic acid using malonic ester synthesis

4. Ethyl benzoate from benzene and ethane