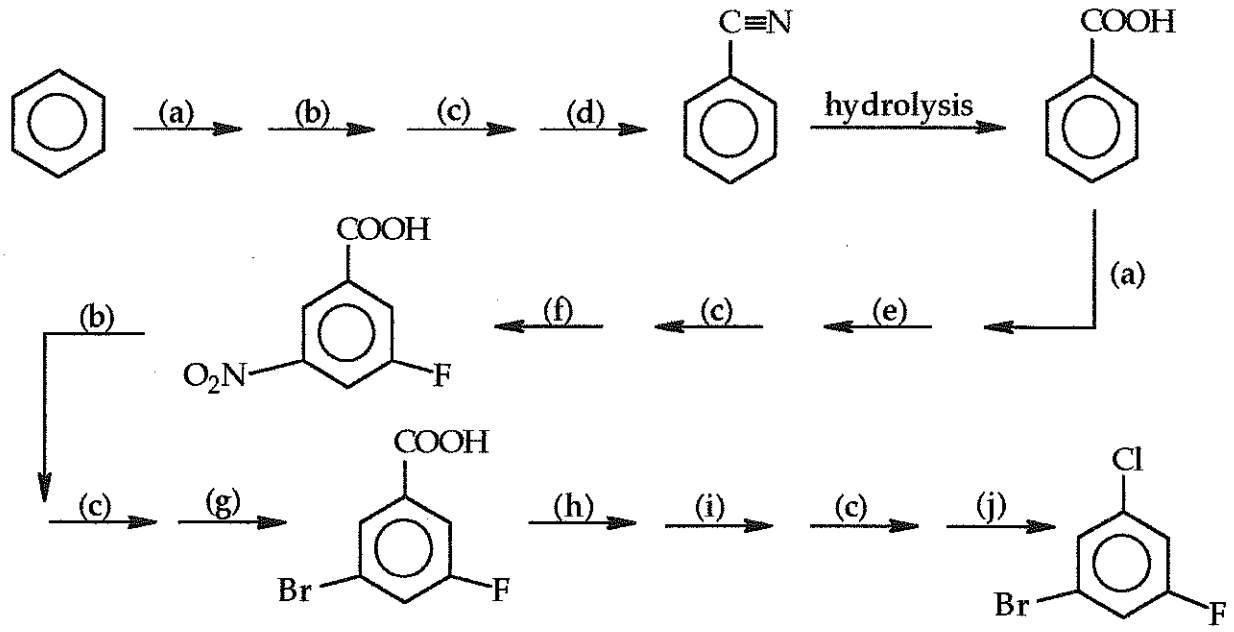
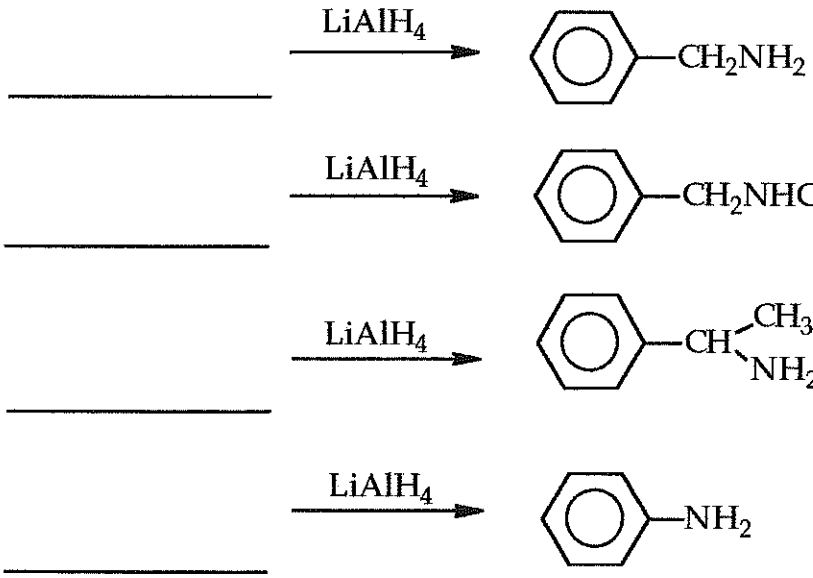
Organic Chemistry II
Dr. M. J. Wieder
Examination #4

Name _____

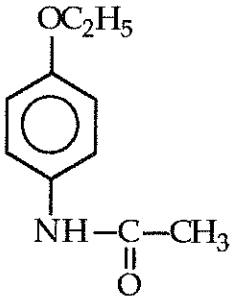
(30) 1. Supply the missing reagents in the synthetic scheme shown below:



(12) 2. In each of the following lithium aluminum hydride reduction reactions to give an amine, provide the structural formula of an appropriate precursor that can be used. To make the problem interesting, the nitrogen functional groups for the precursors chosen must be different.



(16) 3. Synthesize phenacetin (shown below) from benzene and any other necessary reagents. Assume that pure <u>para</u> isomer can be isolated from <u>ortho</u> isomer.



(phenacetin)

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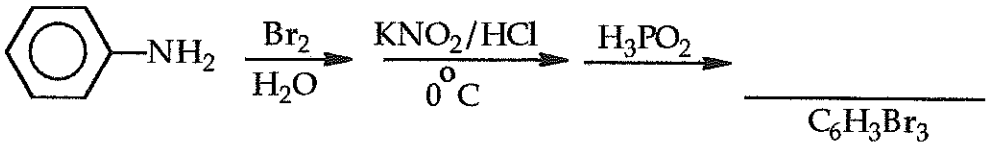
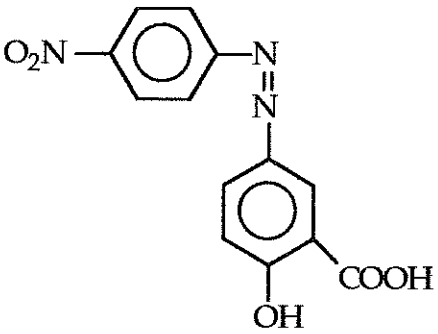
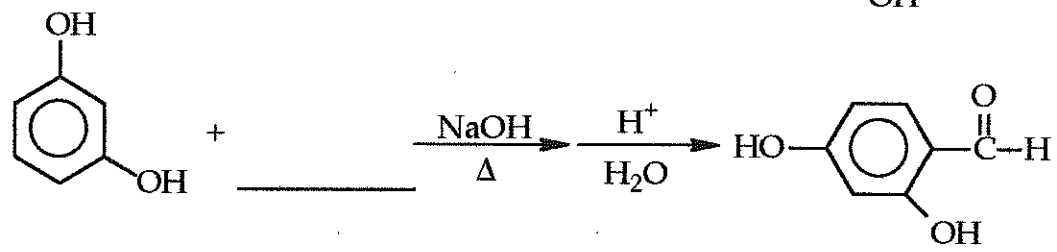
Examination #4 cont'd.

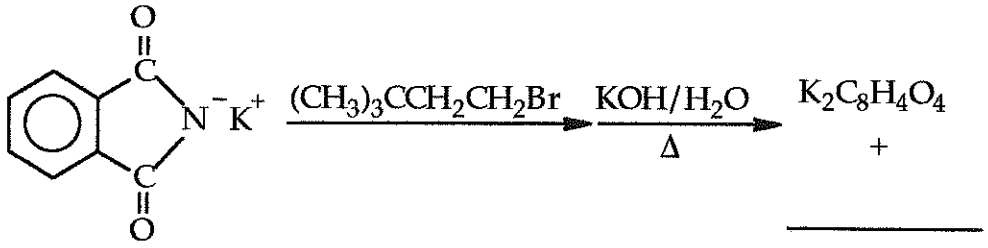
Name _____

4. Supply the correct missing reactants and products in the following chemical equations:

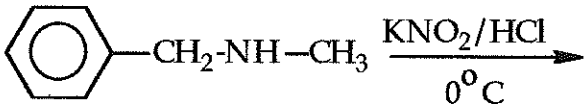
(3) a) 

(6) b) _____ + _____ → 

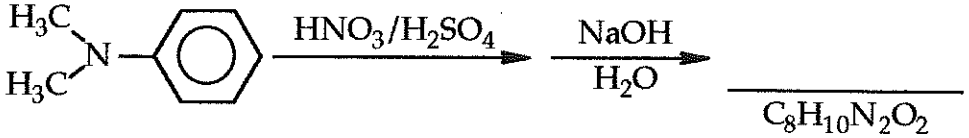
(3) c) 

(3) d) 

_____

(3) e) 

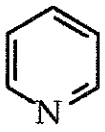
a suspect carcinogen

(3) f) 

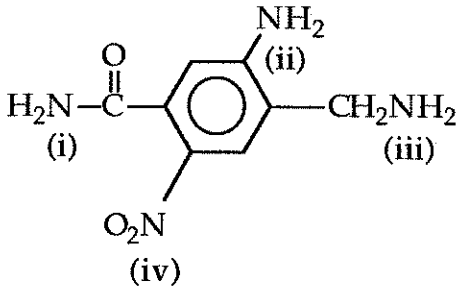
(9) 5. Complete the following statements by selecting the best choice in each case.

a) The structure below that represents a tertiary amine is: _____

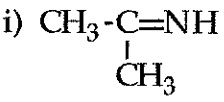
i) $(CH_3)_3CNHC(CH_3)_3$ ii) $(CH_3)_3CCH_2NH_2$

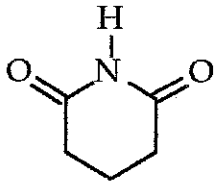
iii)  iv) $(CH_3)_4N^+X^-$

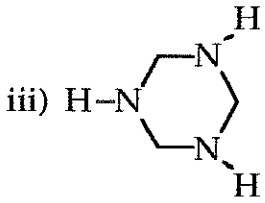
b) The most basic nitrogen atom in the molecule below is: _____

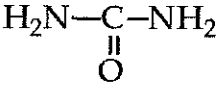


c) The structure below that represents an imide is: _____

i) 

ii) 

iii) 

iv) 

(12) 6. Compounds (X) and (Y) are structurally isomeric amines of formula $C_5H_{11}N$. Compound (X) produces a yellow ppt with nitrous acid at 0°C, whereas compound (Y) produces no visible reaction with nitrous acid at 0°C.

cmr data for (X)	cmr data for (Y)
3 sets of triplets	2 sets of triplets 1 quartet

Based on the data provided, deduce the structures of (X) and (Y).

_____ _____

(X) (Y)