* Preparation of Carboxylic Acids Warm-Up + Application Answers

① Oxidation of 1° ROH, oxidation of aldehydes, oxidative cleavage of alkenes, ozonolysis of alkynes, oxidation of cyclic ketones

② Alkyl Halide $\xrightarrow[\text{ether}]{Mg}$

③ CO_2 + H_3O^+

④ Never use Grignard reagents in the presence of acidic H (NH, SH, OH, C≡CH)

⑤ Alkyl Halide $\xrightarrow{NaCN}$

⑥ Carboxylic acid : Amide

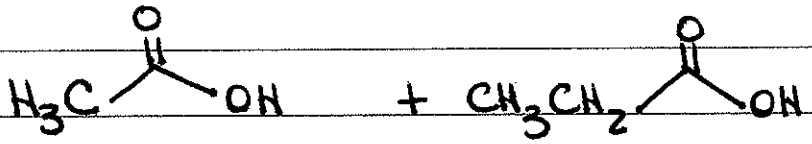
⑦ Formation of a nitrile is accomplished by an S_N2 mechanism therefore, unhindered alkyl halides must be used (3° RX : NEVER)

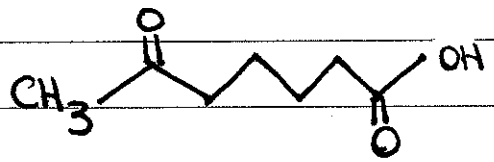
1. $\xrightarrow[H_3O^+]{Cr(VI)}$ or $\xrightarrow[H_3O^+]{KMnO_4}$

2. $\xrightarrow[H_3O^+]{Cr(VI)}$ or $\xrightarrow[H_3O^+]{KMnO_4}$ or $\xrightarrow{O_2}$ or $\xrightarrow{H_2O_2}$ or $\xrightarrow[NH_3]{Ag_2O}$ or $\xrightarrow[NH_3]{AgNO_3}$

→ Tollen's

3. 

4. 

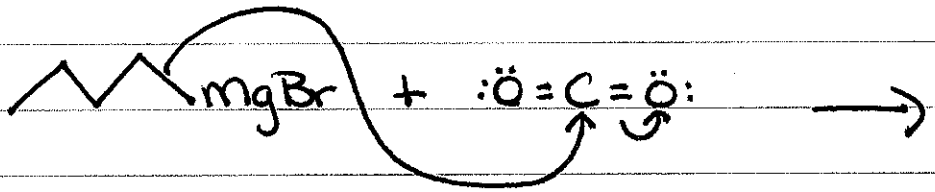
5. 

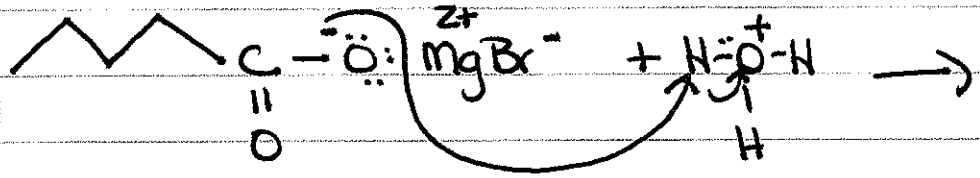
⑥ $CH_3COOH + CO_2$

⑦ $2\ CH_3CH_2COOH$

⑧ No Rxn: To oxidize a cyclic ketone, $HNO_3 + \Delta H$ should be used

⑨





⑩