Spring 2018 (Due on May 2, 2018 at the beginning of the class, no late return, no exam under my office's door will be accepted)

1. Name the following compounds (6 x 2 = 12 pts)

(a)

sec-butyl 2-bromo-4-methoxy-3-oxohex-5-enoate

(b)

6-bromo-4-formyl-5-hydroxy-3-methylhept-2-enoic acid lactone

(c) NH_2 OMe ĊI ОМе

6-amino-2-methoxycyclohex-3-enecarboxylic 4-chloro-2isopropyl-3-methoxypentanoic anhydride

(d)

7-chloro-6-methyl-4-nitro-5,8-dioxooct-2-enenitrile

6-cyano-5-formyl-2-oxocyclohex-3-enecarbonyl chloride

(f)

4-amino-4-bromo-N-ethyl-5-hydroxy-6-methylhept-2-enoic acid lactam

2. Predict the product(s) obtained from the following reactions (2 x 12 = 24 pts)

(a) MeO
$$\longrightarrow$$
 Br 1. Mg/Et₂O MeO \longrightarrow CO₂H 2 \longrightarrow MeO \longrightarrow (b)

(b)
$$O \longrightarrow O$$

$$NH_2 \xrightarrow{P_2O_5} CN \xrightarrow{1.D-MgBr} O$$

$$2. H_3O^+$$

(h)

OH 1.
$$SOCl_2 / heat$$
2. $Li(t-BuO)_3AIH$

OH 1. $BuLi$
2. H_3O^+

OH 1. $BuLi$
2. H_3O^+

OH 2. H_3O^+

OH 3. H_2

OH 4. H_3O^+

OH 4. H_3O^+

OH 5. H_3O^+

OH 6. H_3O^+

OH 6. H_3O^+

OH 7. H_3O^+

OH 9. $H_3O^$

3. Show how you would synthesize each of the following compounds from the given starting materials $(4 \times 2 = 8 \text{ pts})$

(a) OH OH OH OH CUCI, AICI3 OH
$$H_2SO_4$$
 OH H_2SO_4 OH

(c)
$$O \longrightarrow PCC$$

$$Br O \longrightarrow PCC$$

$$Br O \longrightarrow PCC$$

$$H \longrightarrow$$

4. Propose a mechanism consistent with the following reactions (you must show all the intermediates and electrons flow to receive full credit) (3 \times 2 = 6 pts)

(b)
$$NH_3$$
 NH_2 NH_2 NH_2 NH_2