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)

(b)

(c)

(d)

(e)

(f)

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

$$\begin{array}{c}
O \\
NH_2
\end{array}$$

$$\begin{array}{c}
1. \longrightarrow NH_2 \\
\hline
2. NaBH(CN)_3 \\
3. H_3O^+
\end{array}$$

$$\begin{array}{c|c} \text{(d)} & \\ \hline \\ O & \\ \hline \\ O & \\ \end{array}$$

$$\frac{\text{HNO}_3}{\text{N}} = \frac{\text{HNO}_3}{\text{H}_2\text{SO}_4}$$

$$NH_2$$
 H_3O^+

$$\frac{\mathsf{H_2NNH_2}}{\mathsf{NaOH}}$$

3 Show how you would synthesize each of the following compounds from the given starting materials (you must show all the intermediates to receive full credit) $(4 \times 2 = 8 \text{ pts})$ (a)

$$OH \longrightarrow OH$$

$$(d) \longrightarrow C \nearrow N$$

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

(a)
$$H_3O^+$$
 OH

(b)
$$O \longrightarrow NH_3 \longrightarrow O \longrightarrow NH_2$$

$$NH_2$$
 $POCI_3$ CN