**Unit 6 Free Response – Take Home/Open Note**

1. Write out the balanced equation for the reverse reaction of nitrogen oxide, NO, and chlorine, Cl2, to form nitrosyl chloride, NOCl. (4pts)
2. Write the equilibrium constant equations for each of the following reactions. (2pts ea)
   1. 2O3 (g) ↔ 3O2 (g)
   2. CaCO3 (s) ↔ CaO (s) + O2 (g)
   3. CaO (s) + O2 (g) ↔ CaCO3 (s)
3. For the following reactions, calculate the concentration of methanol if the equilibrium concentrations of carbon monoxide and hydrogen are both 0.02M and K = 5.0x103. (6pts)

CO (g) + 2H2 (g) ↔ CH3OH (g)

1. For the reaction below, what is the effect of an increase in pressure? (4pts)

N2O4 (g) ↔ 2NO2 (g)

1. For the indicator bromocresol green, Ka=2.0x10-5. At what pH does this indicator change color? (5pts)