Answer Key: Assignment: The Rate Law

1. The equation for the rate of reaction for the RDS in terms of the concentration of reactants and the rate constant.

2. Exponent sum that represents the number and type of reactants of the concentrations of the species that are part of the RDS.

3.   Zero-order: mol/Ls ($[R]^0$ is 1 therefore k is equal to the units of rate)
     First-order: s^{-1}
     Second-order: Ls/mol

4. c (too ambiguous a question, should probably be changed)

5.   a) 2nd order
     b) 0 order
     c) 3rd order

6.   a) $0.04571 s^{-1}$
     b) $0.1306 mol L^{-1} s^{-1}$

7.   a) Cl_2 is order 1.
     NO is order 2
     b) 3rd order
     c) termolecular
     d) $120 mol L^{-1} s^{-1}$
     e) $R = 120[Cl_2][NO]^2$
     f) $0.00432 mol L^{-1} s^{-1}$
     g) doubled

8.   a) 1st order
     b) $0.02857 min^{-1}$
     c) min^{-1}
     d) i) $5.428 * 10^{-5}$ ii) $3.228 * 10^{-4}$

9.   a) 2nd order
     b) 1st order
     c) 0 order
     d) $R = K[A]^2[B]^1$
     e) $k = 0.2\ L^2 mol^{-2} s^{-1}$

10. $1.021\ L^2 mol^{-2} s^{-1}$