Name _____ Key _____ ID _____ Sec ___

**Q1.** (2 marks)

The following data are for the reaction A → B

| Concentration (M) | Rate (mol/L·s) |
|---|---|
| 0.300 | 1.72 |
| 0.238 | 1.53 |

The order of reaction with respect to A is ___ 1/2 ___

**Q2.** (2 marks)

Concentration-time relation for first-order reaction A → products is given by

$$\ln \frac{[A]_0}{[A]} = kt$$

a) What is $\frac{[A]_0}{[A]}$ after 42 s when $k = 0.56$ min$^{-1}$? ___ 1.5 ___

b) What is $\frac{[A]_0}{[A]}$ when 60% of A has reacted? ___ 2.5 ___

**Q3.** (2 marks)

The following mechanism is proposed for the reaction A + B → C

$$A + D \xrightarrow{k_1} E \qquad \text{fast}$$

$$E + B \xrightarrow{k_2} C + D \qquad \text{slow}$$

a) The intermediate is ___ E ___

b) The catalyst is ___ D ___

c) The overall rate of reaction ≈ ___ $k_2[E][B]$ ___

d) Could the rate of reaction be checked experimentally? ___ No ___

**Q4. T or F** (2 marks)

a) Every collision leads to a reaction. ( F )

b) Collisions between molecules lead to a reaction regardless the orientation of the molecules with respect to each other. ( F )

c) For a reaction to take place, the total kinetic energy of the reacting molecules must exceeds the activation energy of the reaction. ( T )

d) Increasing the temperature speeds up the rate of reaction by lowing the activation energy. ( F )