Kinetics Problems

The following problems refer to the equations:

$$A + B \longrightarrow C + D \tag{1}$$
$$A + C \longrightarrow D + E \tag{2}$$

1. Which species is an intermediate?

2. If the rate of disappearance of A in reaction (1) is $3\ \frac{mol}{\ell \cdot s}$ and the rate of disappearance of A in reaction (2) is $8\ \frac{mol}{\ell \cdot s}$, what is the rate-limiting step in the reaction?

$$2\,A + B \longrightarrow 2\,D + E$$

What is the rate of this reaction?

3. If the rate law for equation (1) is:

$$\text{Rate} = k[A][B]^2$$

what is the order of reaction (1)?

The following data were collected for the reaction $A + B \longrightarrow C$

Exp't #	$[A]$ (M)	$[B]$ (M)	rate formation of C $(\frac{M}{s})$
1	0.20	0.10	3×10^{-2}
2	0.20	0.20	6×10^{-2}
3	0.40	0.20	6×10^{-2}

4. What is the rate law for the above experiment?

5. What is the value of k for the above rate law (in the correct units)?