

An example from the Fall 1998 Hour Examination #1:

4. (20 points)

For each of the following four (4) questions, circle the number that corresponds to the correct answer.

A. A late transition state is structurally and energetically similar to:

1. the starting material
2. the product
3. both of the above
4. neither of the above

B. Covalent bond heterolysis produces:

1. radicals
2. ions
3. carbenes
4. stable, unreactive organic molecules

C. The second most stable, named conformation of *n*-butane is the:

1. anti conformation
2. eclipsed conformation
3. gauche conformation
4. totally eclipsed conformation

D. The rate determining step of the free-radical chlorination of methane is:

1. homolytic dissociation of molecular chlorine
2. hydrogen atom abstraction from methane by a chlorine atom
3. chlorine atom abstraction from molecular chlorine by a methyl radical
4. radical recombination of a chlorine atom and a methyl radical

An example from the Fall 1998 Hour Examination #2:

3. (20 points)

For each of the following five (5) questions, circle the number that corresponds to the correct answer.

A. Increased base concentration causes an E1 reaction to:

1. proceed at a faster rate
2. proceed at a slower rate
3. proceed at the same rate

B. The rate of an S_N2 reaction is faster in:

1. a polar protic solvent
2. a polar aprotic solvent
3. a nonpolar solvent

C. The reaction of (*S*)-3-iodooctane with sodium cyanide affords a substitution product with:

1. retention of configuration
2. partial inversion of configuration
3. complete inversion of configuration

D. Meso compounds contain:

1. no chiral center(s)
2. chiral center(s) and are optically active
3. chiral center(s) and are optically inactive

E. A straight line in Flatland will appear:

1. as a line or a dot
2. only as a line
3. only as a dot