

**NAME (Print):** \_\_\_\_\_

**SIGNATURE:** \_\_\_\_\_

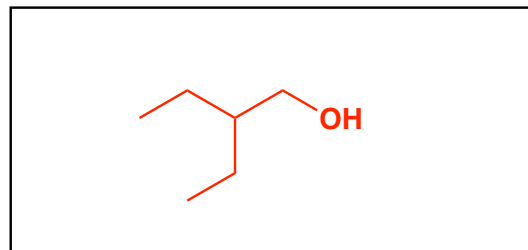
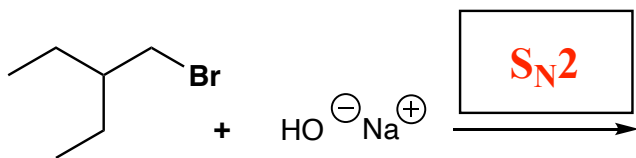
**Chemistry 320M/328M  
Dr. Brent Iverson  
9th Homework  
November 6, 2024**

**Please print the  
first three letters  
of your last name  
in the three boxes**

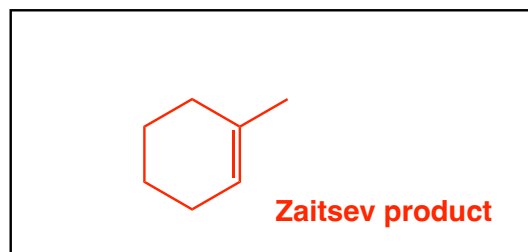
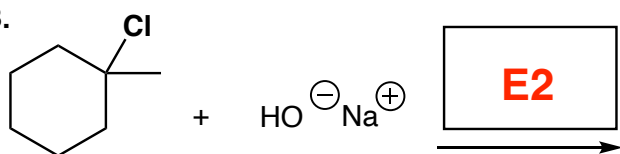
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1. (5 or 6 pts) The following reactions all involve chemistry of haloalkanes. **Fill in the box above the arrow with the mechanism that will be followed ( $S_N2$ , E2, etc.). Then draw only the predominant product or products** and please remember that **you must draw the correct stereoisomers**. For  $S_N1/E1$  reactions you must draw all significant products (including all stereoisomers).

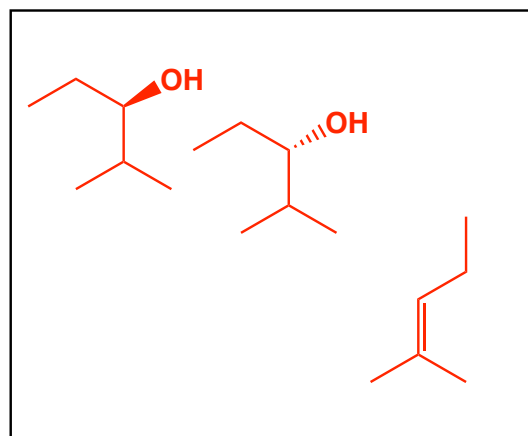
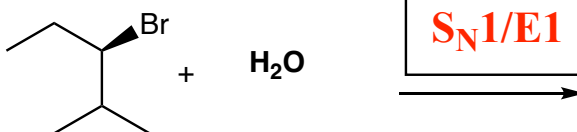
A.



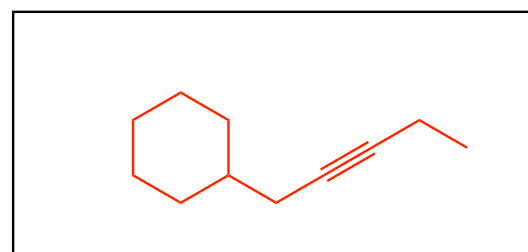
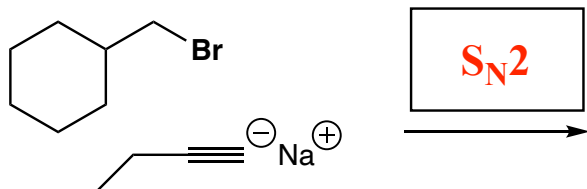
B.



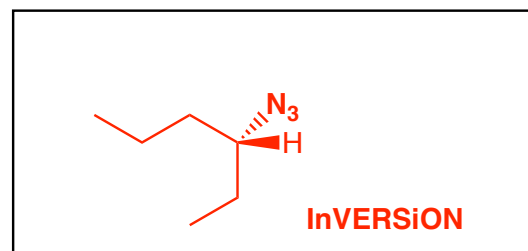
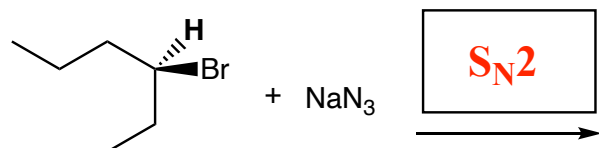
C.

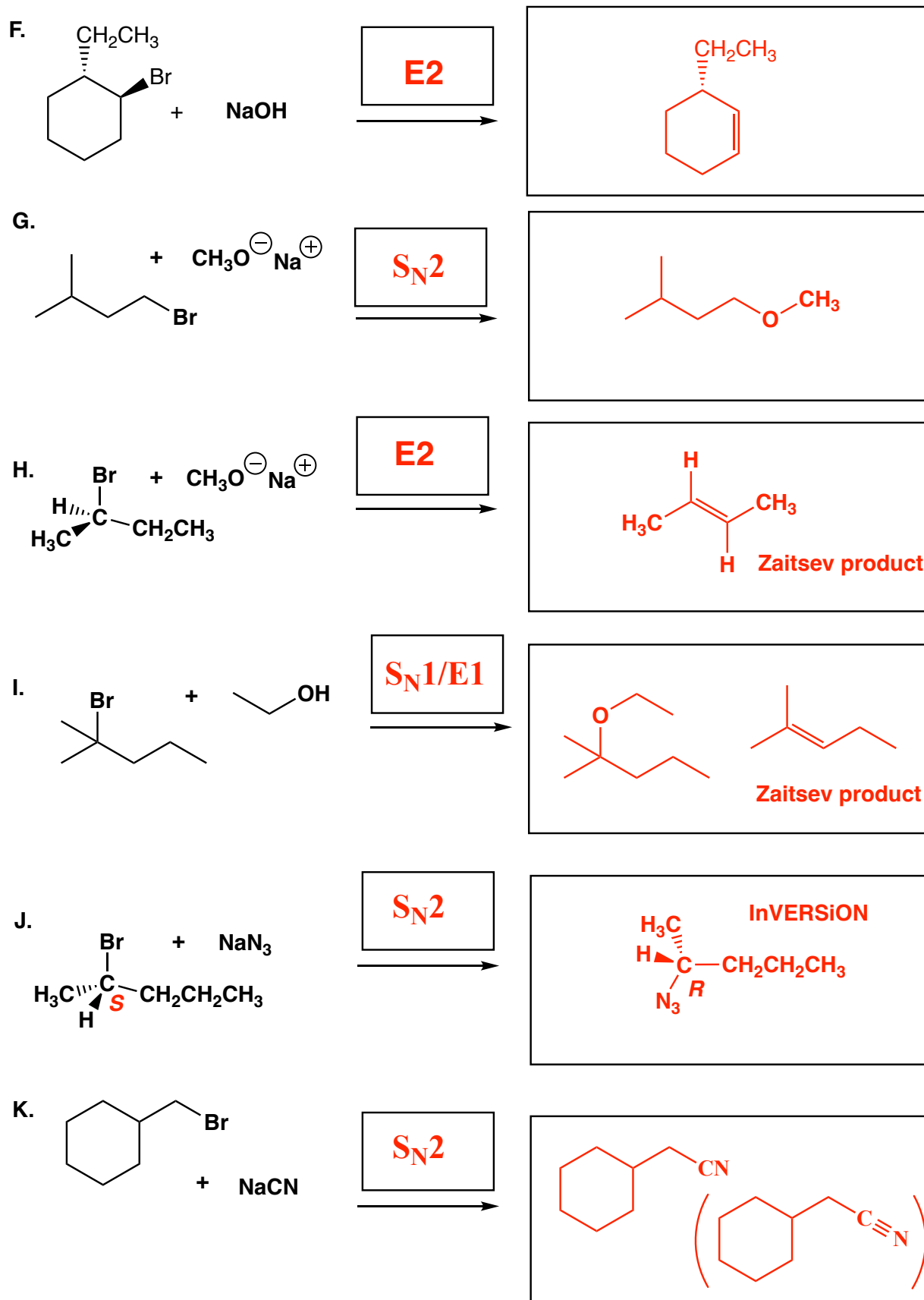


D.



E.





2. (20 pts) Consider the following statements that refer **S<sub>N</sub>1**, **S<sub>N</sub>2**, **E1**, **E2**, or a **radical chain reaction** mechanism. Fill in the circles to indicate to which mechanism(s) each statement applies.

- |   |   |  |   |
|---|---|--|---|
| A. A reaction in which the predominant product is predicted by Zaitsev's rule.  | <input type="radio"/> S <sub>N</sub> 2<br><input type="radio"/> S <sub>N</sub> 1            | <input checked="" type="radio"/> E2<br><input checked="" type="radio"/> E1 | <input type="radio"/> Radical chain reaction            |
| B. A reaction observed when tertiary haloalkanes react with any nucleophile that is not a very weak base.                                     | <input type="radio"/> S <sub>N</sub> 2<br><input type="radio"/> S <sub>N</sub> 1            | <input checked="" type="radio"/> E2<br><input type="radio"/> E1            | <input type="radio"/> Radical chain reaction            |
| C. A reaction that involves an anti-periplanar transition state.  | <input type="radio"/> S <sub>N</sub> 2<br><input type="radio"/> S <sub>N</sub> 1            | <input checked="" type="radio"/> E2<br><input type="radio"/> E1            | <input type="radio"/> Radical chain reaction            |
| D. A reaction that involves initiation, propagation and termination steps.  | <input type="radio"/> S <sub>N</sub> 2<br><input type="radio"/> S <sub>N</sub> 1            | <input type="radio"/> E2<br><input type="radio"/> E1                       | <input checked="" type="radio"/> Radical chain reaction |
| E. A reaction that is favored for secondary haloalkanes when a nucleophile that is NOT a strong base and is also NOT a very weak base is used | <input checked="" type="radio"/> S <sub>N</sub> 2<br><input type="radio"/> S <sub>N</sub> 1 | <input type="radio"/> E2<br><input type="radio"/> E1                       | <input type="radio"/> Radical chain reaction            |
| F. A reaction mechanism that involves a carbocation intermediate.   | <input type="radio"/> S <sub>N</sub> 2<br><input checked="" type="radio"/> S <sub>N</sub> 1 | <input type="radio"/> E2<br><input checked="" type="radio"/> E1            | <input type="radio"/> Radical chain reaction            |
| G. A reaction mechanism that involves only a transition state, no intermediate.   | <input checked="" type="radio"/> S <sub>N</sub> 2<br><input type="radio"/> S <sub>N</sub> 1 | <input checked="" type="radio"/> E2<br><input type="radio"/> E1            | <input type="radio"/> Radical chain reaction            |
| H. A reaction that causes InVERSiON of stereochemistry at the site of reaction.   | <input checked="" type="radio"/> S <sub>N</sub> 2<br><input type="radio"/> S <sub>N</sub> 1 | <input type="radio"/> E2<br><input type="radio"/> E1                       | <input type="radio"/> Radical chain reaction            |
| I. A reaction that will occur when Br <sub>2</sub> and light are used with an alkane.   | <input type="radio"/> S <sub>N</sub> 2<br><input type="radio"/> S <sub>N</sub> 1            | <input type="radio"/> E2<br><input type="radio"/> E1                       | <input checked="" type="radio"/> Radical chain reaction |
| J. A reaction that involves initiation, propagation and termination steps. <b>Yep, this one is here twice because it is important!</b>        | <input type="radio"/> S <sub>N</sub> 2<br><input type="radio"/> S <sub>N</sub> 1            | <input type="radio"/> E2<br><input type="radio"/> E1                       | <input checked="" type="radio"/> Radical chain reaction |
| K. A reaction observed when secondary haloalkanes react with a nucleophile that is a very weak base (as solvent).                             | <input type="radio"/> S <sub>N</sub> 2<br><input checked="" type="radio"/> S <sub>N</sub> 1 | <input type="radio"/> E2<br><input checked="" type="radio"/> E1            | <input type="radio"/> Radical chain reaction            |