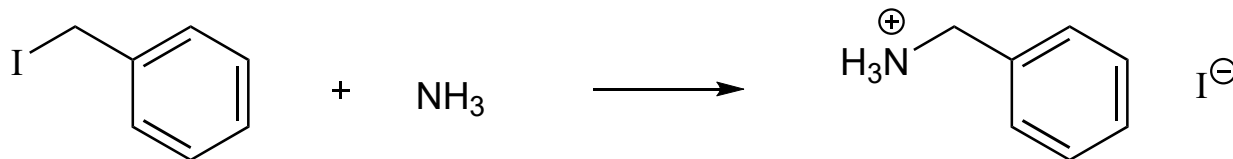
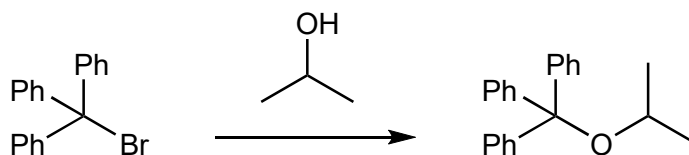


3A) (5 pts) Provide a **complete mechanism** for the following  $S_N2$  substitution reaction. Pay close attention to details including lone pairs, formal charges and the use of curved arrows.

*To save time, start with the drawings provided!*



3B) (5 pts) Draw the transition state of the **rate-determining step** of the following  $S_N1$  reaction:



C) (8 pts) For each reaction, predict what mechanism will account for the major product(s) formed ( $S_N1$ ,  $S_N2$ ,  $E1$ ,  $E2$  or **N.R.**). No explanation or drawing of the product(s) is needed.

