(1) (a) Which of the following two compounds is expected to undergo ring-opening at the faster rate? Clearly explain your reasoning and provide a structure for the product of the faster reaction.

![Compounds A and B](image)

(b) How would you classify the following pericyclic reaction? Predict whether it is likely to occur under thermal or photochemical conditions. Does the reaction proceed antarafacially or suprafacially?

![Pericyclic Reaction](image)

(c) Explain why the $^{13}$C NMR of homotropylidine shows only three signals.

![Homotropylidine](image)

(2) Show how the products are formed in the following reactions.

(a) ![Reaction A](image)

(b) ![Reaction B](image)

(c) ![Reaction C](image)