1. Name the following alkenes:
   a. 
   ![Diagram 1]
   b. 
   ![Diagram 2]
   c. 
   ![Diagram 3]
   d. 
   ![Diagram 4]

2. How many degrees of unsaturation are in the following compounds?
   a. 
   ![Diagram 5]
   b. 
   C_{12}H_{14}BrNO_2

3. Distinguish between electrophiles and nucleophiles. Give examples of each.

4. Identify the electrophile and nucleophile for the following processes:
   a. \( \text{CH}_3\text{CH}_2^+ + \text{Br}^- \rightarrow \text{CH}_3\text{CH}_2\text{Br} \)
   b. \( \text{CH}_2=\text{CH}_2 + \text{HBr} \rightarrow \text{CH}_3\text{CH}_2^+ + \text{Br}^- \)
   c. 
   ![Diagram 6]
5. Given the reaction coordinate diagram for the reaction of A to form G, answer the following:

![Reaction Coordinate Diagram]

a. How many intermediates are formed in the reaction? Which one is more stable?
b. Which letters represent transition states? Which one is the least stable?
c. What is the fastest step in the reaction? Which one is the slowest step?
d. Is A or G more stable? Is the overall reaction endergonic or exergonic?
e. Does A or E form faster from C?
f. Which step has the largest rate constant (k)?

6. Rank the following in order of increasing heats of hydrogenation:

I

II

III

IV

V

VI