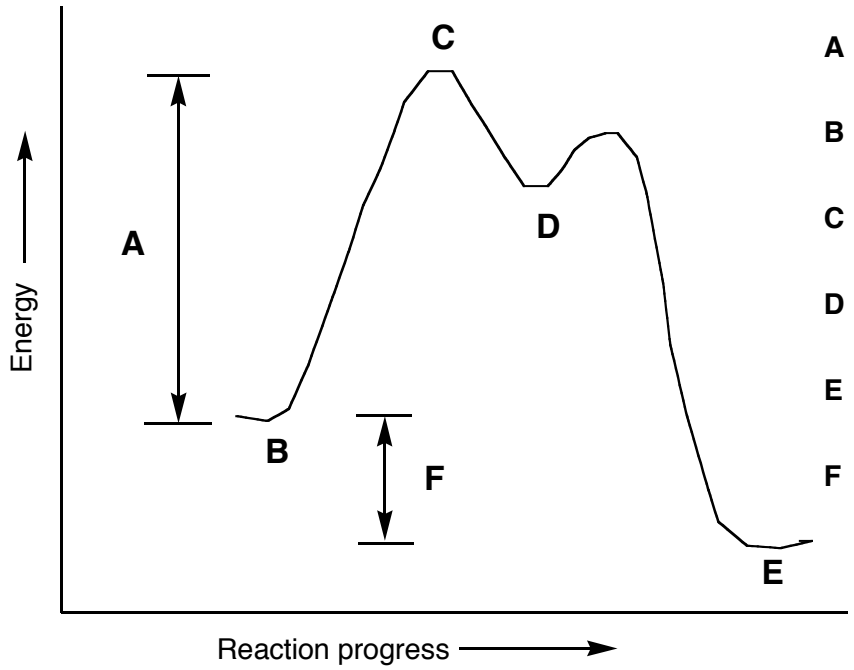
1. Identify **A**-**F** on the reaction diagram shown below. (12 pts)



A ΔG‡ (activation energy)

B Reactants

C Transition state

D Intermediate

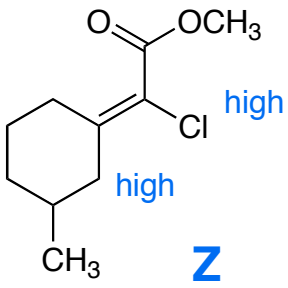
E Products

F ΔG° (Gibbs free energy change)

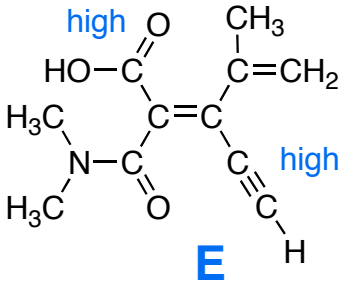
2. Calculate the degrees of unsaturation for a compound with the formula $C_{18}H_{13}FN_2O_2$. (3 pts)

Formula:	C18H13FN2O2	
if saturated hydrocarbon:	C18H38	CnH(2n+2)
H- deficiency	H25	
correction for F	-1	
correction for N2	+2	
Index of H-deficiency	26	
Degrees of unsaturation:	26/2 = **13**	

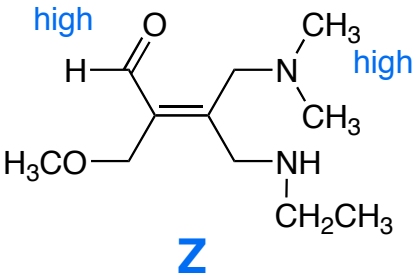
3. Identify the following as E or Z. (6 pts)



Z

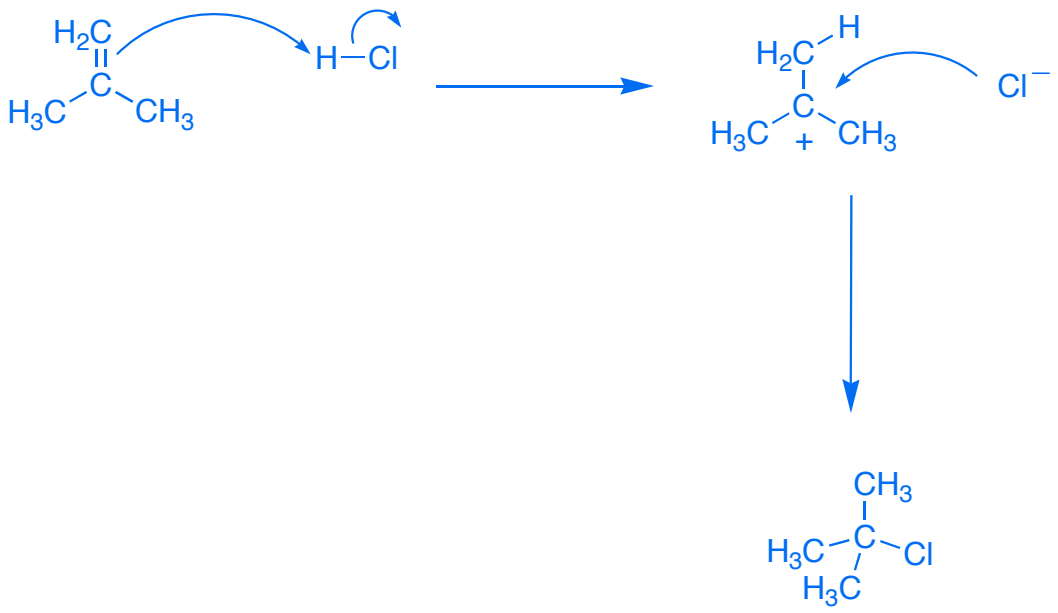


E



Z

4. Draw a complete mechanism for the addition of HCl to 2-methylpropene. (4 pts)



Problem 1 (12 pts) _____

2 (3 pts) _____

3 (6 pts) _____

4 (4 pts) _____

Total (out of 25) _____