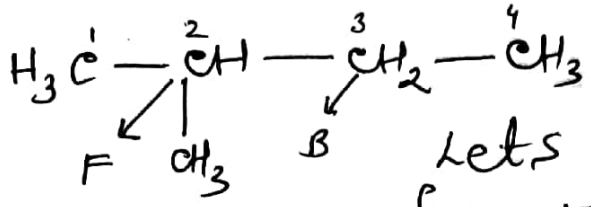
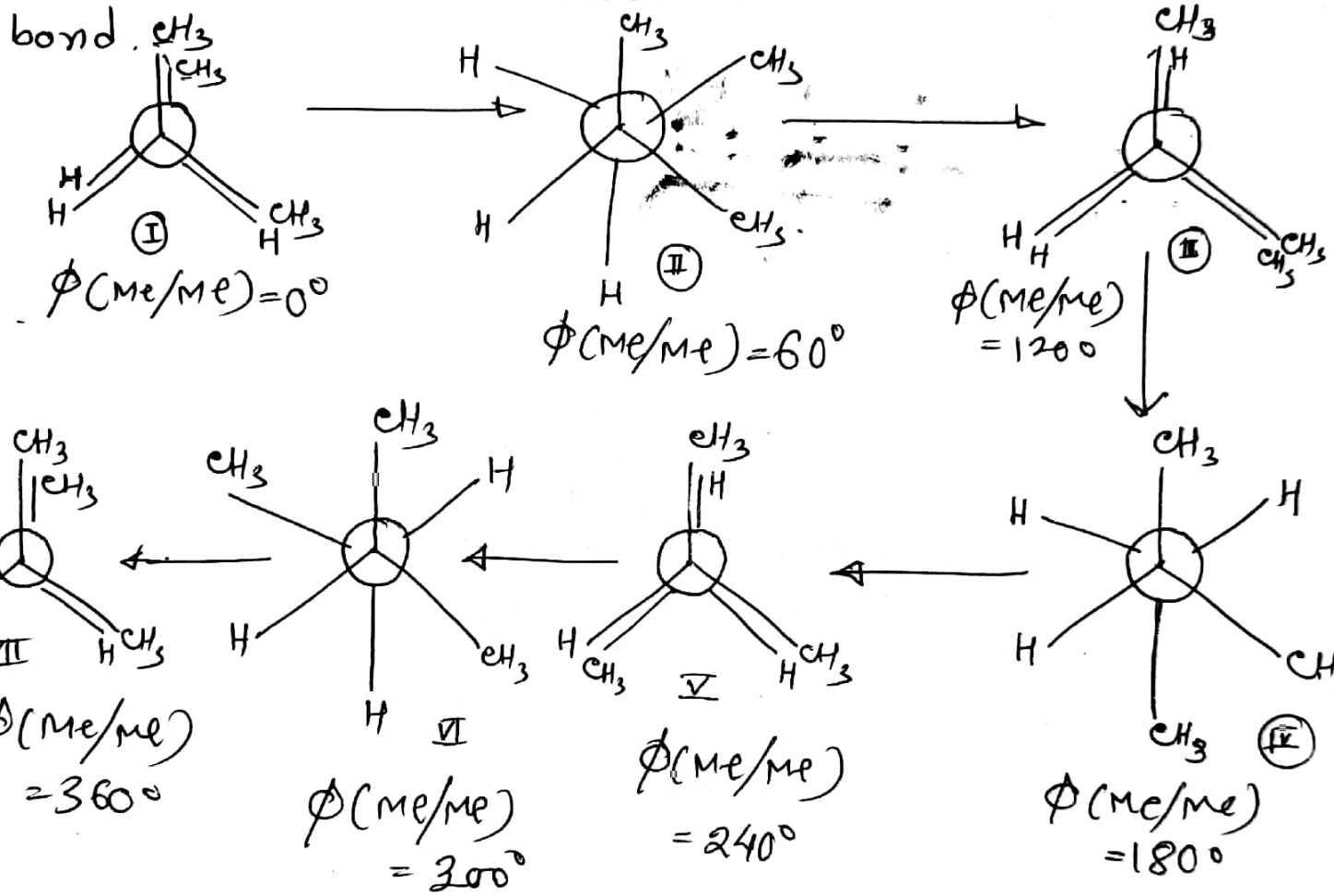
Conformational analysis of 2-methyl butane

Day-7.



Lets assume C–C free rotation around C_2–C_3 bond.



Energy order among str's (II), (IV), (VI).

$\overline{IV} = \overline{VI}$ (Energy). $\quad IV, VI < II$

Because in II there are 2 gauche interaction betw^n Me/Me. but in IV & VI there is only one Me/Me gauche interaction

Energy order among str's I, III, V, VII.

$\overline{I} = \overline{III} = \overline{VII}$ (Energy).

(In all case there is one Me/Me and one Me/H eclipsed interaction).

Energy of V is maximum

Calculation of energy.

Me/Me eclipsing energy = 2.9 Kcal/mol

Me/H " " = 1.8 " /,

Total energy of I, III, VII is.

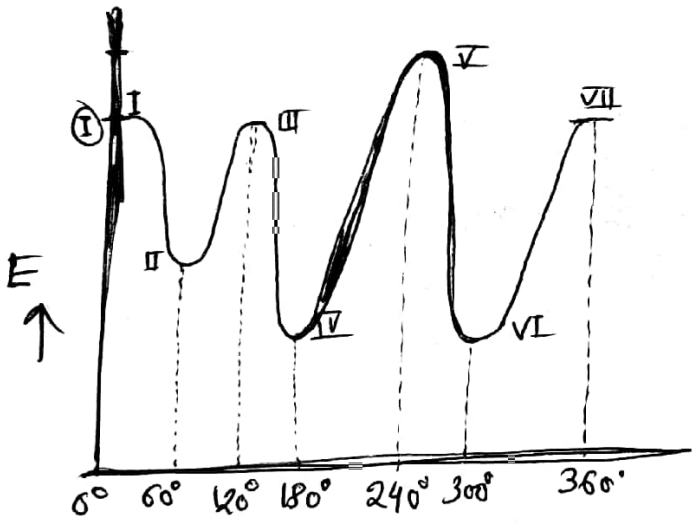
$(2.9 \times 1 + 1 \times 1.8) = 4.7$ Kcal/mol

Total energy of V = $(3 \times 1.8 = 5.4$ " "

Therefore the energy Profile diagram will be

(overall energy order

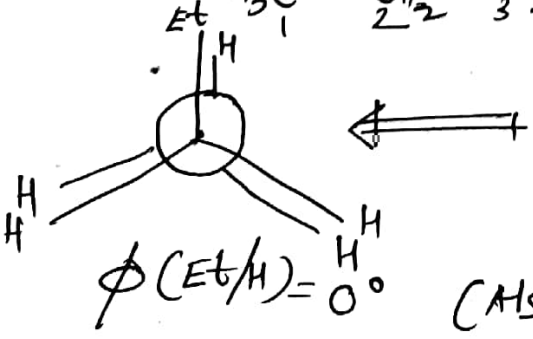
V > I, III, VII > II > IV, VI



H.W- Draw Torsional curve of n-butane. assuming $C_1 - C_2$ single bond free rotation.

$H_3C_1 - CH_2 - CH_2 - CH_3$ ≡ $H_3C_1 - CH_2 - Et$

C_2 - Front
C_1 - Back



Starting from this, draw all the conformations (Also draw torsional curve of ϕ(Et/H) = 180° of initial str.