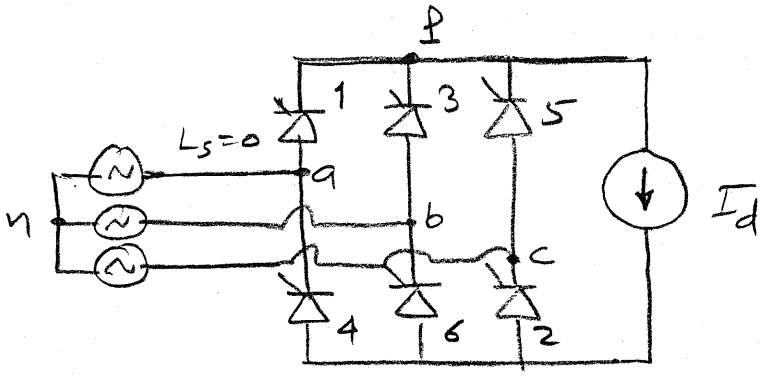
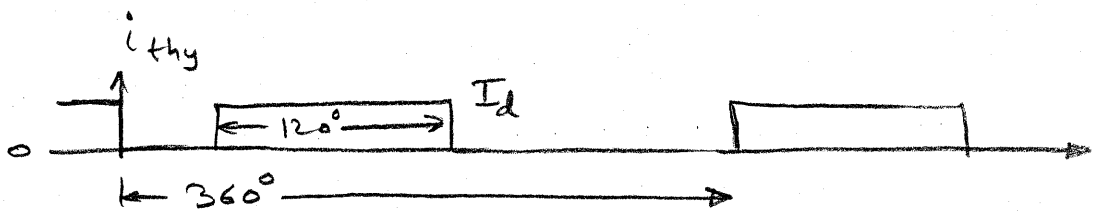
Problem 6-13



When the thyristor 3 is conducting, the peak (maximum) inverse voltage appearing across thyristor 1 is the peak of v_{ab}, which is $\hat{V}_{LL}$. Therefore, the peak inverse voltage (PIV) across any thyristor is

$$PIV = \hat{V}_{LL} = \sqrt{2}\, V_{LL} = \sqrt{2}\sqrt{3}\, V_{ph(rms)}.$$

In the absence of L_s, the current through each thyristor flows for 120° during each cycle.



$$\therefore \quad I_{thy(avg)} = I_d/3$$

$$I_{thy(rms)} = \frac{I_d}{\sqrt{3}}$$