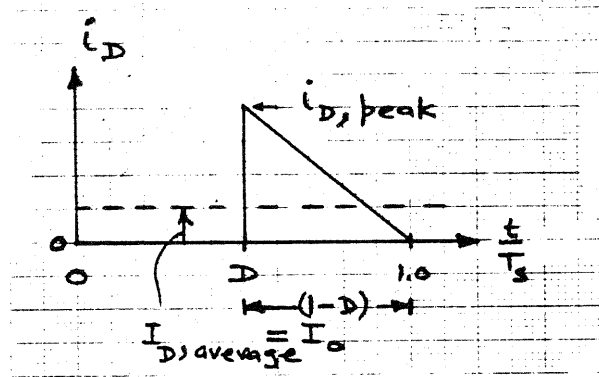


# Problem 7-9

From problem 7-8 we know that this converter is operating at the <sup>Conduction</sup> boundary between continuous and discontinuous. Therefore  $i_{D,peak}$  is as shown below.



$$I_{D,rms} = \sqrt{(1-D)} \frac{i_{D,peak}}{\sqrt{3}} = \sqrt{0.5} \frac{(2.0)}{\sqrt{3}} = 0.816A$$

( $\sqrt{3}$  = RMS FACTOR FOR TRIANGULAR WAVES).

$$i_d = i_{D,average} + i_{ripple}$$

Since

$$I_{D,average} = I_o,$$

$$I_{ripple,rms} = [I_{D,rms}^2 - I_o^2]^{1/2} = \sqrt{0.816^2 - 0.5^2}$$

$$\boxed{I_{ripple,rms}} = 0.645 A$$