

Expt 5

Modi Omkar

19EE30018

Part A

For 5V on LV side of transformer

$$\frac{N1}{N2} = \frac{400\sqrt{2}}{5\sqrt{3}}$$

Part B

i) $V_d = \frac{3\sqrt{2}}{\pi} V_{LL} \cos \alpha$
Given $V_d = 380, V_{LL} = 440$

$$\alpha = 50.24^\circ$$

iii) Maximum reverse voltage across the thyristor = 476V

Part D

R=50.7188 for 10A constant load current

Firing angle = 30 degrees

Parameter	Full-controlled Converter	Semi-controlled Converter
AC side currents (RMS)	8.1524	8.274
Fundamental component of the AC side currents (RMS)	7.782	7.542
THD (in %) of the AC side currents	31.15	41.99
Input power factor	0.826	0.898
Fundamental active power (W)	8904.2	9593.17
Fundamental reactive power (VAr)	5140.7	2570.51