3) Efficiency :— (η)

Efficiency = $\frac{\text{input power}}{\text{output power}} = \frac{(P_{AC})}{(P_{DC})}$

3) $\eta = \frac{P_{O/P}}{P_{I/P}} = \frac{P_{dc}}{P_{ac}} = \frac{V_{dc} I_{dc}}{V_{rms} I_{rms}}$

3) Efficiency :- (η)

Efficiency = $\frac{\text{output power}}{\text{input power}} = \frac{P_{DC}}{P_{AC}}$

$\eta = \frac{P_{O/P}}{P_{I/P}} = \frac{P_{dc}}{P_{ac}} = \frac{V_{dc} I_{dc}}{V_{rms} I_{rms}}$

$V_{dc} = I_{dc} \cdot R_L$ OR $I_{dc} = \frac{V_{dc}}{R_L}$, $V_{rms} = I_{rms}(r_f + R_L)$

$\eta = \frac{I_{dc}^2 \cdot R_L}{I_{rms}^2 (r_f + R_L)}$

$I_{dc} = I_m / \pi$

$I_{rms} = I_m / 2$

$\eta = \frac{I_m^2/\pi^2 \, R_L}{I_m^2/4 \, (r_f + R_L)}$

$= 4 \times \frac{R_L}{\pi^2 (r_f + R_L)}$

$\eta = \frac{4}{\pi^2} = 0.405 \times 100\%$

$\eta = 40.5\%$ The efficiency is very much less in HWR hence to increase the efficiency we should use more than 1 diode i.e FWR.

★ Peak inverse voltage (PIV) it is the reverse voltage when diode is non conducting. In HWR. PIV = V