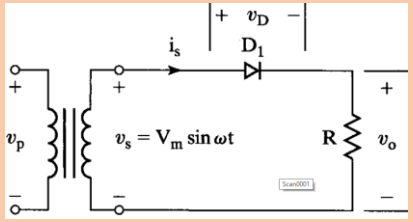
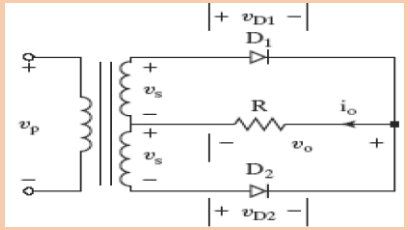
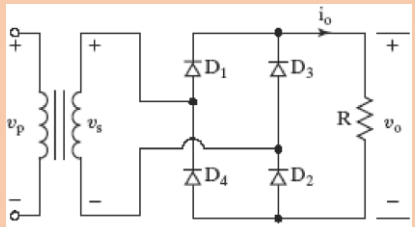
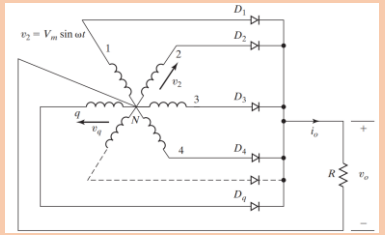
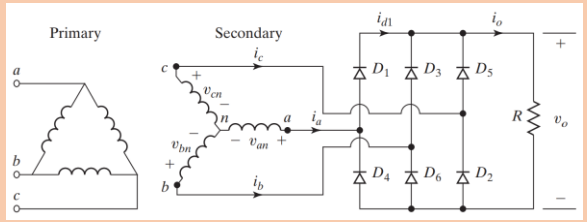
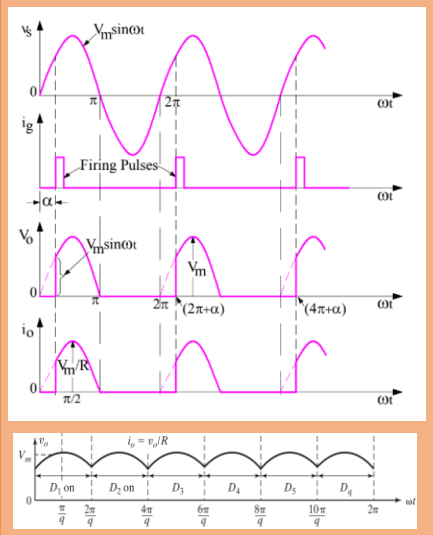
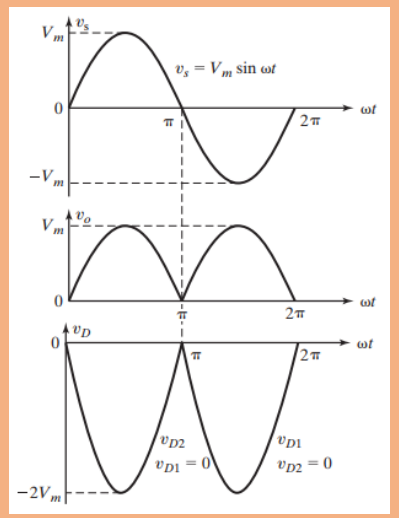
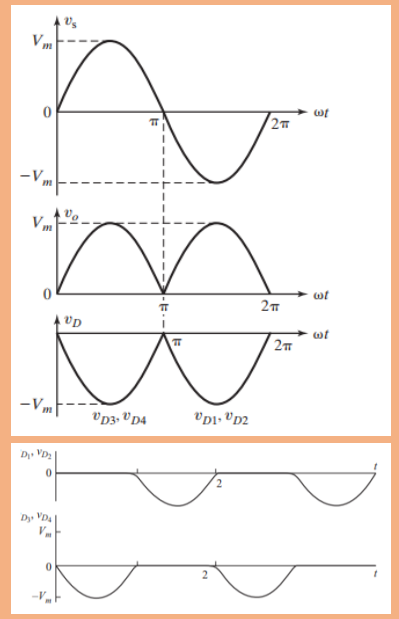
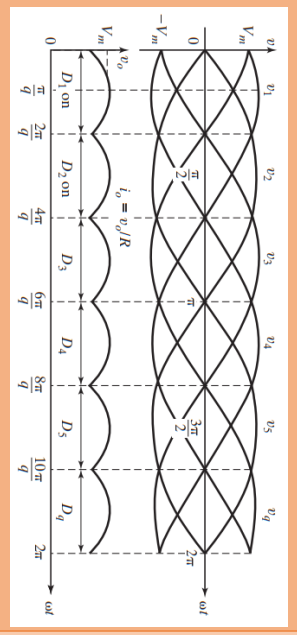
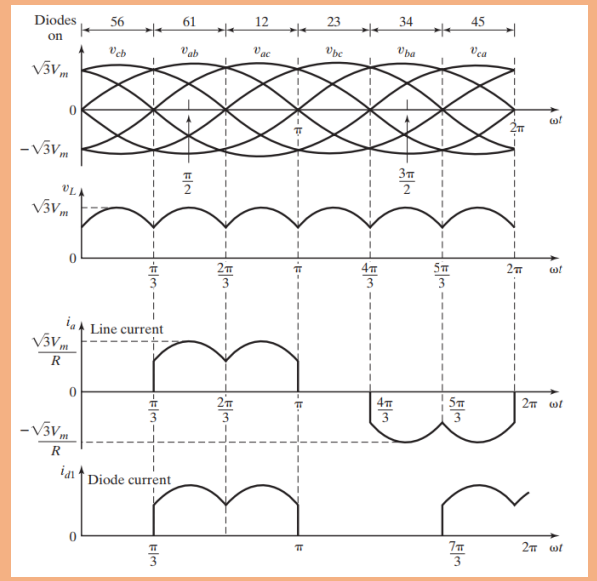
RAFAY AAMIR GULL
BSEE19047
POWER ELECTRONICS A3

For R load only	Single Phase Half Wave Rectifier	Single Phase Center Tap Full Wave Rectifier	Single Phase Full Wave Rectifier	Six Phase Star Rectifier	Three Phase Bridge Rectifier
Circuit Diagram					
Voltage and Current waveforms of Diode and load					
VDC , IDC and PDC	$Vdc = \frac{Vm}{2\pi}(1-\cos(wt))$ $I = \frac{Vdc}{R}$ $P_{dc} = V_{dc} I_{dc}$	$Vdc = 0.6366Vm$ $I = \frac{Vdc}{R}$ $P_{dc} = V_{dc} I_{dc}$	$Voc = .637V_{max.}$ $I_{dc} = \frac{1}{2\pi}\int_0^{2\pi} i_s(t)d(\omega t)$ $P_{dc} = V_{dc} I_{dc}$	$Vdc = Vm\frac{q}{\pi}\sin\left(\frac{\pi}{q}\right)$ $I = \frac{Vdc}{R}$ $P_{dc} = V_{dc} I_{dc}$	$Vdc = 1.654Vm$ $I = \frac{\sqrt{3}\,Vm}{R}$ $P_{dc} = V_{dc} I_{dc}$

Vrms , Irms and Prms	$V_{rms} = \frac{V_m}{2}$ $I_{rms} = \frac{I_m}{2}$ $Prms = (Vrms)(Irms)$	$\frac{V_m}{\sqrt{2}}$ $I_{rms} = \frac{V_{rms}}{R}$ $Prms = (Vrms)(Irms)$	$V_{rms} = \frac{V_m}{\sqrt{2}}$ $I_{rms} = \frac{I_m}{2}$ Prms = Vrms*Irms	$Vrms = Vm\sqrt{\frac{3}{\pi}\left(\frac{\pi}{6} + \frac{\sin\left(\frac{\pi}{3}\right)}{2}\right)}$ $I_{rms} = \frac{V_{rms}}{R}$ Prms = Vrms*Irms	Vrms = 1.6554Vm Irms = 1.6554Vm/R Prms = Vrms*Irms
Efficiency	$\eta = \frac{P_{dc}}{P_{ac}}$	$\eta = (0.6366V_m)^2/(0.707V_m)^2$	$\eta = \frac{P_{dc}}{P_{ac}}$	$\eta = \frac{P_{dc}}{P_{ac}}$	$\eta = (0.6366V_m)^2/(0.707V_m)^2$
Form Factor (FF)	$Form\ Factor = \frac{V_{rms}}{V_{avg}} = \frac{V_m/2}{V_m/\pi} = \frac{\pi}{2} = 1.57$	$FF = 0.707V_m/0.6366V_m$	FF = Irms/ Iavg	$FF = 0.707V_m/0.6366V_m$	$FF = 0.707V_m/0.6366V_m$
Ripple Factor (RF)	$RF = \sqrt{FF^2 - 1} = 1.21$	$RF = \sqrt{FF^2 - 1}$	$RF = \sqrt{FF^2 - 1}$	$RF = \sqrt{FF^2 - 1}$	$RF = \sqrt{FF^2 - 1}$
Total Harmonic Distortion (THD)	$THD = \frac{1}{V_{o1}}\left(\sum_{n=2,3,...}^{\infty} V_{on}^{\ 2}\right)^{1/2}$	$HF = \left(\frac{I_s^2 - I_{s1}^2}{I_{s1}^2}\right)^{1/2} = \left[\left(\frac{I_s}{I_{s1}}\right)^2 - 1\right]^{1/2}$	$HF = \left(\frac{I_s^2 - I_{s1}^2}{I_{s1}^2}\right)^{1/2} = \left[\left(\frac{I_s}{I_{s1}}\right)^2 - 1\right]^{1/2}$	$HF = \left(\frac{I_s^2 - I_{s1}^2}{I_{s1}^2}\right)^{1/2} = \left[\left(\frac{I_s}{I_{s1}}\right)^2 - 1\right]^{1/2}$	$HF = \left(\frac{I_s^2 - I_{s1}^2}{I_{s1}^2}\right)^{1/2} = \left[\left(\frac{I_s}{I_{s1}}\right)^2 - 1\right]^{1/2}$
Power Factor (PF)	**PF < 1**	$PF = \frac{P_{ac}}{VA}$	P/(Vrms*Irms)	PF = Pac/3VsIs	PF = Pac/3VsIs
Peak Inverse Voltage	$PIV = V_m = \sqrt{2}V_{rms}$	$PIV = 2V_m.$	$V_{rms} = \frac{V_m}{\sqrt{2}}$	$\sqrt{3}\ Vm$	$\sqrt{3}\ Vm$
Output Voltage ripple frequency	**150 Hz**	**120 Hz** $0.637V_{max}$	**6f** **(where f is the frequency of AC supply)**	$0.637V_{max}$	$0.637V_{max}$