



1. A three-phase, half-wave, uncontrolled rectifier is supplied at 220V from a source of reactance $0.24\Omega/\text{phase}$. Neglecting resistance and device voltage drops, determine the mean load voltage, the overlap angle and plot the load voltage and supply current waveforms for a level load current of 40A.
2. A three-phase, half-wave, controlled rectifier is supplied at 220V from a source of reactance $0.24\Omega/\text{phase}$. Neglecting resistance and device voltage drops, Drive an expression to find the mean load voltage in terms of the overlap angle. Determine the mean load voltage, the overlap angle and plot the load voltage and supply current waveforms for a level load current of 40A, at firing delay angles of 45° and 90° .
3. A three-phase, fully controlled bridge rectifier is connected to a 380 V(Line) with a source inductance 0.1 mH Drive an expression to find the mean load voltage in terms of the overlap angle. Determine the mean load voltage, the overlap angle and plot the load voltage and supply current waveforms for a level load current of 40A, at firing delay angles of 0° and 90° .
- 4) If the average voltage of a 3-phase, fully-controlled, bridge rectifier is decreased by 5% due to the effect of the source reactance. The AC supply voltage is 440-V, 60-Hz, and the triggering angle is 22.150 . The bridge feeds a highly inductive load of $R= 50\Omega$. Find:
 - (i) the overlap angle
 - (ii) the load current
 - (iii) the source inductance.