Rectifier

Almost all electronic circuits need DC voltage for their working. This DC voltage can be obtained by dry cells and batteries. Use of a dry cell is practicable only in portable electronic circuits such as transistor radio, tape recorders etc. But in circuits requiring large voltages and currents, like high power audio amplifiers, television sets etc. batteries will not only be very expensive but also be voluminous. An alternative method of obtaining DC voltage is by converting the AC mains supply of 240V, 50Hz into DC voltage. This technique is not only convenient but also takes very small space compared to battery packs. This process of converting AC to DC is known as rectification.

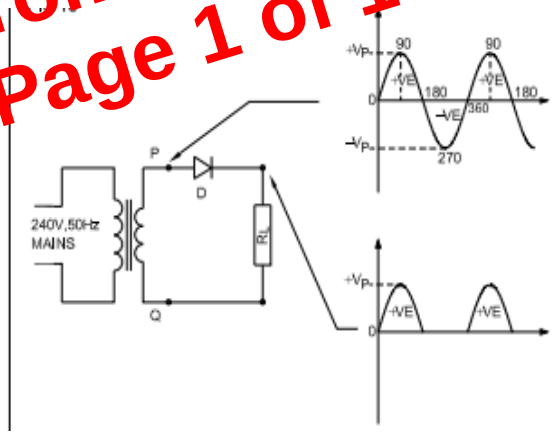
Types of Rectifier

1. Half wave rectifier
2. Full wave rectifier
3. Bridge rectifier

1. Half wave rectifier

The simplest form of AC to DC converter is obtained by using one diode. such an AC to DC converter is known as half-wave rectifier.At the secondary of the transformer, across terminals P & Q, when seen on a CRO, the electric signal is a sinusoidal wave with its peak value of VP and a frequency determined by the rate at which the alternations (+ve to –ve) are taking place. The frequency is 50Hz as this voltage is taken from 50Hz AC mains supply.

If the voltage across P and Q is measured using an AC voltmeter, the voltmeter shows



the rms (root mean square) value, Vrms of the sinusoidal wave which will be less than the peak value. The relationship between VPeak and Vrms is given by, Vrms= 0.707 Vpeak .....[1] conversely, V V 0.707 peak 2 V rms = = rms

When this sinusoidal signal is applied across the diode D. signal is applied across the diode D as shown in Fig 10, the diode conducts (behaves as a closed switch) only during the +ve half cycle of the input sinusoidal voltage and does not conduct (behaves as a open switch) during the -ve half of the input sinusoidal voltage. This process repeats again and again thus producing a pulsating +ve wave form at the output across the load,

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