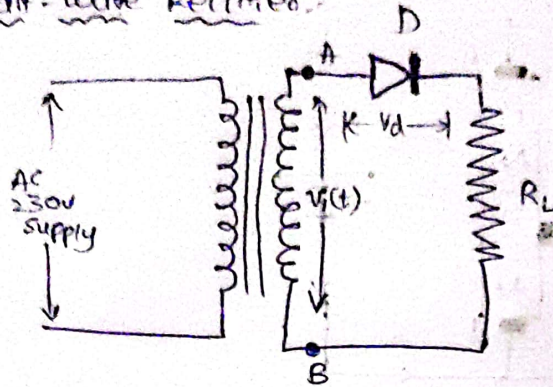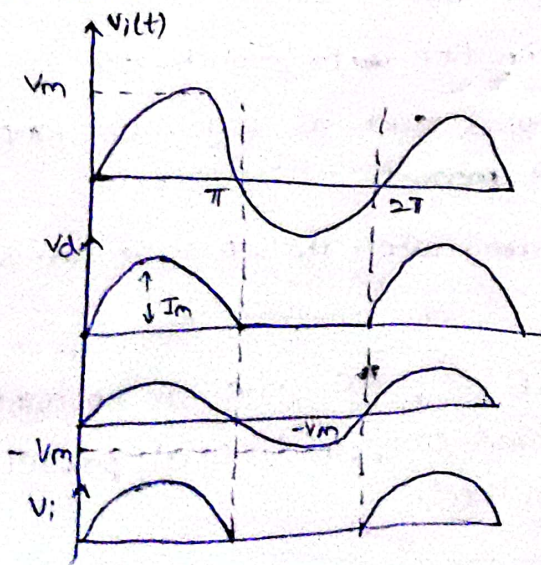(1) Half wave Rectifier.

Ans) Half wave Rectifier:

→ In Half wave rectifier, the purpose of the transformer is to step down the input ac supply.

→ During the positive half cycle of input voltage, end A becomes positive (+ve) with respect to B. This makes the diode forward biased and hence it conducts current

→ During the negative half cycle of input voltage, end A becomes negative (-ve) with respect to B. This makes the diode reverse biased and it does not conduct current.

→ It converts bidirectional to unidirectional.

Disadvantages :-

→ The output is low.

→ Filtering is required to produce steady current.

→ ∴ Ripple Frequency = I/P signal Frequency

Characteristics

1) $0 - \pi$:- Diode . ON

→ Current flows

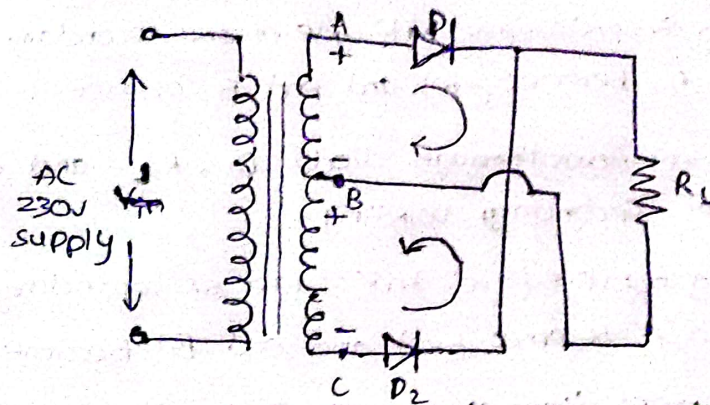→ Max. current flows when $v_i = v_m$

(ii) $\pi - 2\pi$:- Diode - OFF

→ No current flows

→ $i = 0$, $v_d = -v_m$

∴ $I_m = \dfrac{V_m}{R_f + R_L}$

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2) Full wave Rectifier.

Full - wave Rectifier

→ In Full wave Rectifier (FWR), current flows through load in the same direction for both half cycles of I/p ac voltage. This can utilise both half cycles of I/p ac voltage to produce DC output.

→ For positive half-cycles of input voltage, one diode supplies current to load and for the 've' half cycle of input other diode supplies current to the load in the same direction.
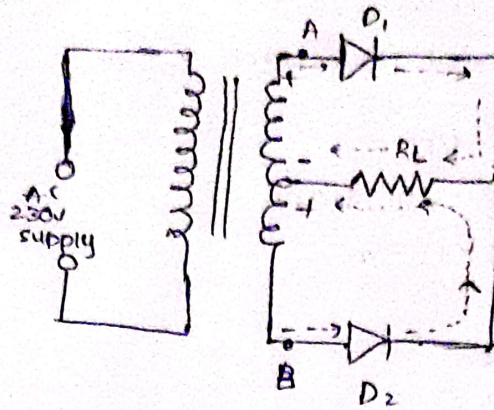
→ There are two-types of full wave Rectifier.

(i) Centre - TAPPED (FWR)

(ii) Full - wave Bridge Rectifier.

i) centre-Tapped FWR:-

→ A centre tapped transformer is used to establish the input signal across each section of the secondary transformer.

→ During the positive (+ve) half cycle of the secondary voltage, the end 'A' becomes (+ve) and end B becomes (-ve).

→ The current flows through diode D_1, R_L, and upper half of secondary winding.

→ During negative (-ve) half cycle of secondary voltage, the end 'A' becomes (-ve); and end B becomes (+ve).

→ The current flows through the Diode D_2, R_L and lower half of secondary winding.

ii) Full-wave Bridge Rectifier:-
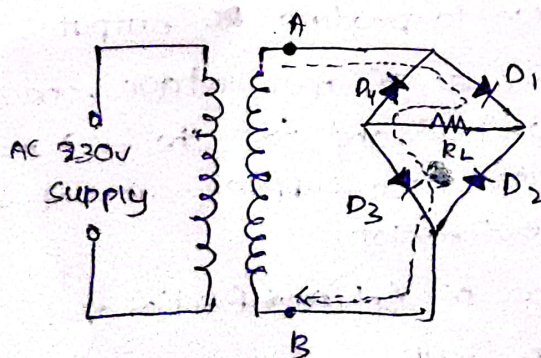
→ The need of centre tapped transformer is eliminated in bridge rectifier.

→ During positive (+ve) half cycle of secondary voltage,

the end 'A' becomes (+ve) and end 'B' becomes (-ve).

→ Therefore, the diodes D_1 and D_3 conducts so that current flows from 'A' to 'B' through R_L.

→ During negative half cycle of secondary voltage, the end 'A' is (-ve) and end 'B' is positive (+ve).

→ Therefore, the diode D_2 and D_4 conduct, so that current flows from 'B' to 'A' through R_L.