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| **Expt. No:** | | **9** | **Full Wave Rectifier** |
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| **Date:** |  | |
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**Aim:**  To study, design and implement Full Wave Rectifier Circuit.

**SOFTWARE TOOLS / OTHER REQUIREMENTS:**

1. Multisim Simulator/Circuit Simulator

# Theory:

The circuit diagram of the Bridge Rectifier along with inou-toutput waveforms is shown in figure below. The four diodes D1, D2, D3 and D4 are arranged in a bridge configuration and hence the name. The circuit contains a transformer that steps down the input ac magnitude depending on the requirement and provides the necessary isolation avoiding any risk of shocks.



Let Vi = Vm sin wt be the input signal at the transformer secondary, it is a sinusoidal signal with maximum amplitude Vm. During the positive half-cycle of the input, the point A being positive with respect to the point B, the diodes D1 and D3 will be forward biased; however, the diodes D2 and D4 will be reverse biased. The pair of diodes D1 and D3 start conduction resulting in a current ID flowing through the load resistor RL in the direction marked for the entire positive half-cycle, i.e. from wt = 0 to π and the diodes D2 and D4 will be in OFF condition. During the negative half-cycle of the input, the point B will be positive with respect to the point A and the diodes D2 and D4 will be forward biased, and the diodes D1 and D3 will be reverse biased. Diodes D2 and D4 start conduction resulting in a current ID flowing through the load resistor RL again in the same direction (as earlier) for the entire negative half-cycle, i.e.

from wt = π to 2π and the diodes D1 and D3 will be in OFF condition. Thus, between wt = 0 to π, D1 and D3 conduct and result in an output, between wt = π to 2π, D2 and D4 conduct and result in an output Vo as indicated in Fig. (b). It can therefore be observed that for both cycles of input, there is a current flowing, hence the name full-wave rectifier.



**Circuit diagram (from multisim)**

**waveforms (fROM multisim)**

**Conclusions**