Experiment No.- 2

Objective of the Experiment: **To Study the 1- phase Half Wave Rectifier with R, Motor load with freewheeling diode.**

Equipment Needed:

1. Scientech 2700 Trainer Kit.
2. Resistor and Motor Load.
3. Patch Cords.
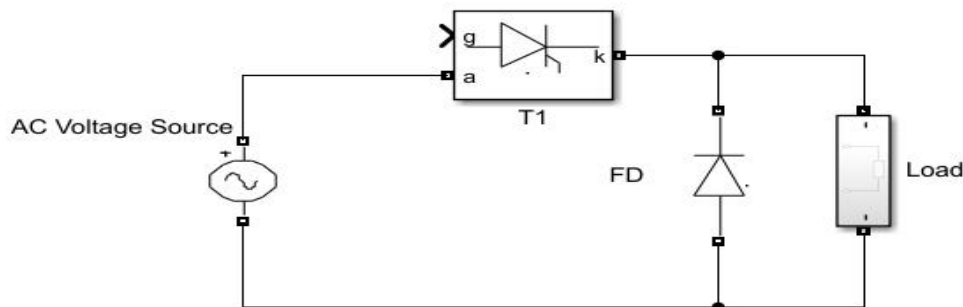4. DSO.

Circuit Diagram:

Fig. 1: 1-phase half wave rectifier with freewheeling diode.

Note: Gate pulse will be given by firing circuit unit internally.

Procedure:

1. Make the connections as per the given circuit diagram.

2. Give the gate pulses from the firing circuit unit to the SCR assembly carefully.

3. Connect the given resistor then motor load and then motor load with freewheeling diode.

4. Connect the DSO probe and multi-meter across the load.

5. Make sure the connections are **OK** and patch cords are **not loose**.

6. Switch on the main supply**.**

7. Take the required readings from the DSO and multi-meter.

8. Calculate the desired result from the observed data.
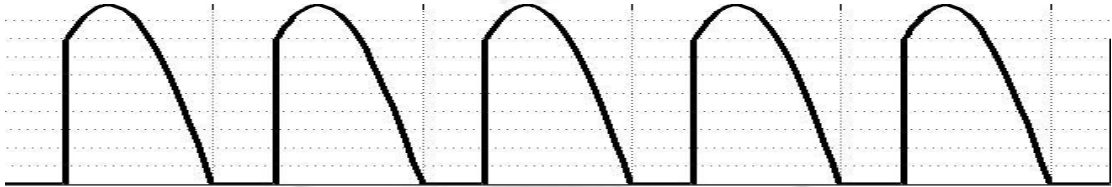
Desired Output Voltage Waveforms:

1. **Resistor Load**
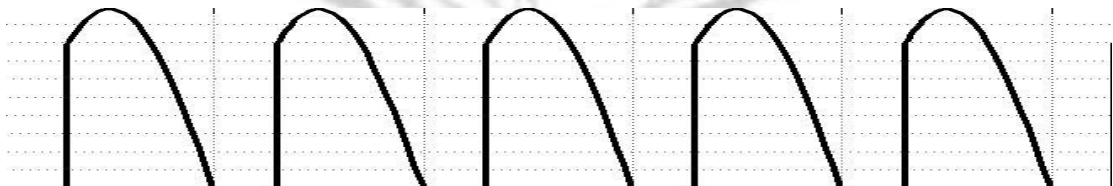
2. **Motor Load:**
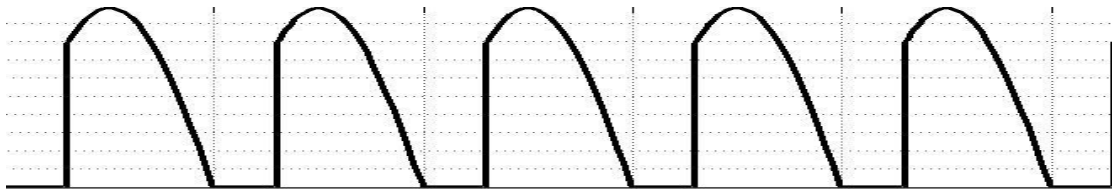
3. Motor and Free Wheeling Diode

Observation Table:

				Average Output Voltage (V_O) (Volt)		
Sl No.	Firing Angle (α^0)	Extinction Angle (β^0)	Conduction Angle (γ^0)	V_O(Meas.)	V_O(Cal.)	% Error
			V_{peak} (V_m) =	V		
1.						
2.						
3.						
4.						
5.						

Calculation:

For R- Load, R-L Load and Motor load with freewheeling diode:

$$V_0 = \frac{V_m}{2\pi}(1 + cos\alpha)$$

For Motor Load:

$$V_0 = \frac{V_m}{2\pi}(cos\alpha - cos\beta)$$

Discussion:

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