EXPERIMENT 5

OBJECT: - To design and implement controlled bridge rectifier using three-phase SCR bridge module with RL load.

APPARATUS REQUIRED:-

1. SCR bridge module.
2. 1 phase supply 230V AC with neutral
3. CRO (unearthed)

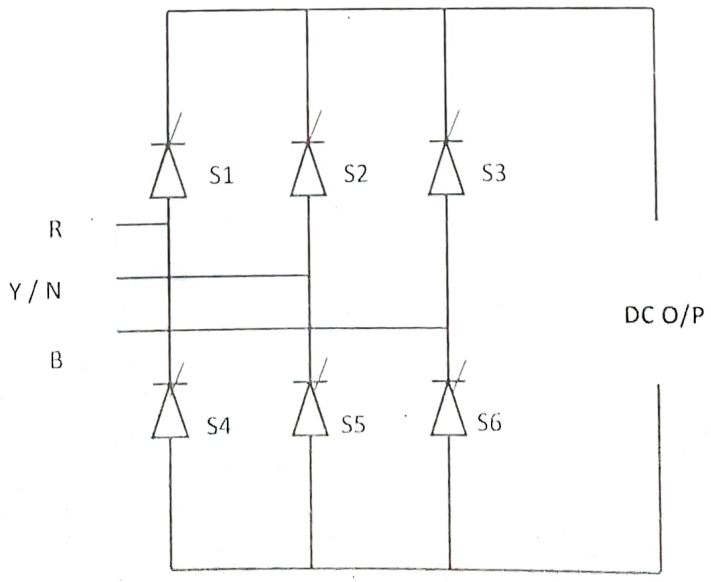
THEORY:-

SCR is a four layer P-N-P-N device whose various terminals are marked as Anode (A), Cathode (K) and Gate (G). SCR is unidirectional device. It can be made to conduct in forward direction by applying positive voltage between anode-cathode terminals and making gate terminal positive with respect to cathode terminal. There is some maximum forward blocking voltage VBO, above which the SCR break-down and starts conducting in forward direction without need for any gate current. SCR also breakdowns in reverse direction when a certain maximum reverse voltage is exceeded. this voltage is called VBR. This reverse breakdown is destructive and hence should not be tried.

For operating SCRs as switches, an appropriate gate voltage or base current must be applied to drive the devices into saturation mode for low on –state voltage. The control voltage should be applied between the gate and cathode terminals. The power converters generally require multiple SCRs and each SCR must be gated individually.

CIRCUIT DIAGRAM: -

The unit consist of 6 SCR connected in bridge format. the circuit diagram is given as follows:



Here, the bridge module can be used for 3 phase and single phase connection. In 3 phase bridge circuit, all 6 SCRs are come into picture whereas in single phase bridge circuit only 4 SCR come into picture. As this is SCR bridge module, gate pulses have to be connected externally in proper sequence as given on front panel.

PROCEDURE:-

For single phase

1. Connect the live wire or R-ph to T1.(REMOVE THE Y AND B PHASE).
2. Connect the neutral to T2.
3. Connect the load across o/p.(lamp load)
4. Switch On power to rectifier unit, (3 phase / 1 phase supply switch)
5. Observe o/p voltage waveform across T4 w.r.t. T5. on C.R.O. and note down o/p voltage
6. Switch OFF supply of unit

CAUTION:-

1. Use unearthed CRO while observing Waveforms of high output voltage. For low output voltage there is no need of unearthed CRO.

OBSERVATION TABLE:-

S.N.	Firing Angle	Output Voltage
1.		
2.		
3.		

CONCLUSION:-