Power Electronics Laboratory (EE3P004)

EXPERIMENT-3

Operation of Three Phase Bridge Rectifier

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AIM OF THE EXPERIMENT:

To study the operation of Three Phase Bridge Rectifier

APPARATUS REQUIRED:

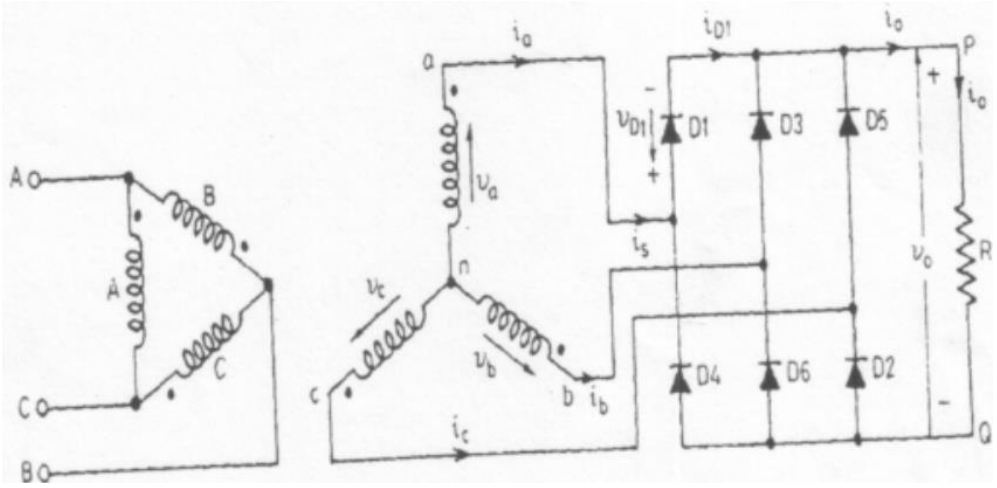
Sl. No.	Apparatus Required	Specification	Quantity
01	Module (Three Phase Bridge Rectifier)	415 V, 25 A	01No.
02	Digital Storage Oscilloscope (TDS 2014C)	4 Channel, 100 MHz, 2Gs/s	01No.
03	Voltage Probe (TPP0201)	200 MHz, 10 MΩ/<12pF, 10x	01No.
04	Multimeter		1 No
05	Load	150 Ω, 4 A	1 No
06	Patch Chord		13 Nos

THEORY:

A rectifier is a circuit that converts ac input voltage to DC output voltage. A rectifier employing diodes is called uncontrolled rectifier. Power circuit of three-phase rectifier consists of six diodes. The diodes are arranged in three legs. Upper diodes D1, D3, D5 constitute the positive group diodes. The lower diode D2, D4, D6 form the negative group diode three phase transformer feeding the bridge is connected in delta –star.

Positive group of diode conducts when these have the most positive anode. Similarly negative group diode will conduct if these have most negative anode In other word diodes D1,D3,D5 forming positive group ,would conduct when these experience the highest positive voltage .likewise diode D2,D4,D6 would conduct when these are subjected to the most negative voltage.

CIRCUIT DIAGRAM:



OBSERVATION:

Table-1 (R Load):

Sl. No	V_{in} (Volts)	V_o (Volts)	I_o (Amps)	Load (ohms)
1	61	96.5	0	0
2	61	76.2	0.42	200
3	61	71.0	0.80	400
4	61	66.9	1.16	600
5	61	63.2	1.51	800

Table-2 (R-L Load):

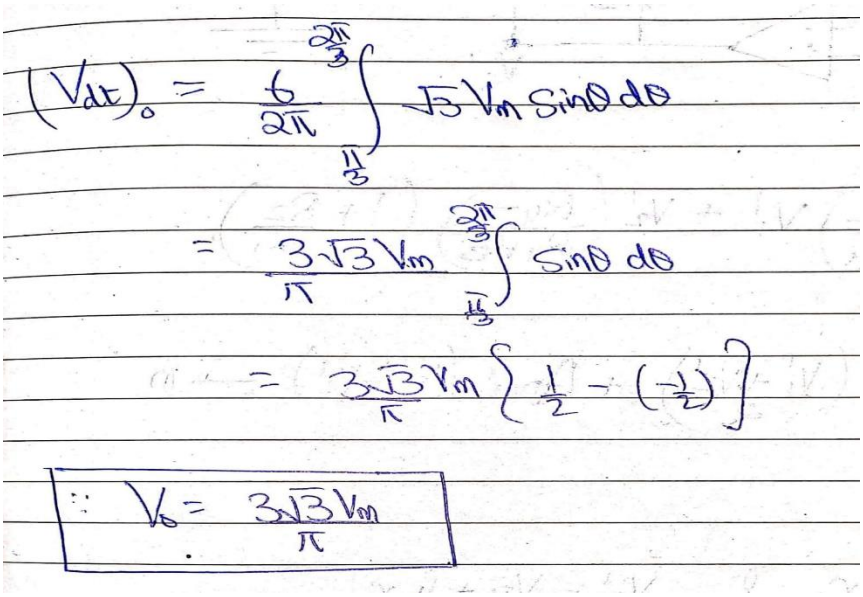
Sl. No	V_{in} (Volts)	V_o (Volts)	I_o (Amps)	Load (ohms)
1	61	80	0.43	200 ohms 120 mH
2	61	74.5	0.82	400 ohms 120 mH
3	61	70	1.18	600 ohms 120 mH
4	61	66	1.52	800 ohms 120 mH

DISCUSSION

1. Why do you think the output voltage decreases with load?

From the experiment, we found that as load increases for both R and R-L loads current got increased. Since the current got increased the voltage drop across the switch which will eventually decrease the output voltage.

2. Give the calculation of the theoretical value of the output voltage?



CONCLUSIONS:

We have noted the readings of output voltage and output current values for different R and R-L loads appropriately. Hence our aim to study the operation of three-phase bridge rectifier with different types of loads is accomplished successfully.