Experiment : Power Supply

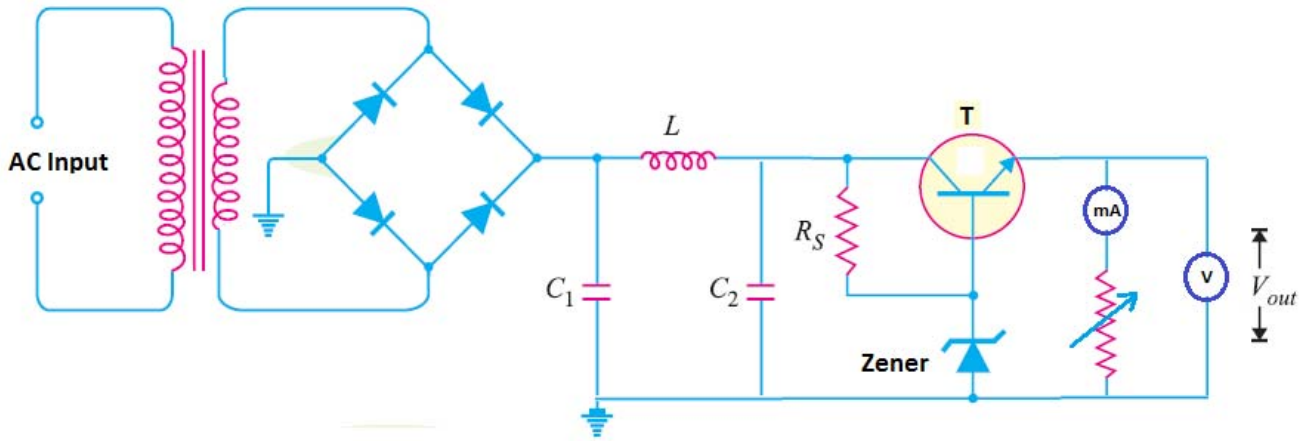
Object : *To Study the characteristics of regulated DC Power supply.*

Apparatus used: *Variable AC source, Transformer, four diode, two capacitor, one inductor, one resistance, one transistor, dc voltmeter, mili-ammeter, variable resistor.*

Theory and circuit diagram:

A ***dc power supply*** is an electronic circuit which generates dc voltage using ac as input. If out put of dc power supply remains unaltered under the variation of load current or input ac then it is called as ***regulated power supply***. It has following components.

1. Step Down Transformer: It converts high ac voltage to low ac voltage.
2. Bridge Rectifier: It converts ac input voltage to dc voltage.
3. Filter Circuit: It reduces ripples which is present in output of rectifier.
4. Regulator Circuit: It regulates the output voltage of filter to be independent of variation in load current and input voltage.



Observation :

1. **Table for input AC voltage and output DC voltage**

Sr.No.	Input AC voltage (volt)	Output DC voltage (volt)
1	0	0
2	20	1.6
3	40	3.4
4	60	5.6
5	80	8.0
6	100	10.0
7	120	11.6
8	140	11.8
9	160	11.8
10	180	11.8
11	200	11.8
12	220	11.8

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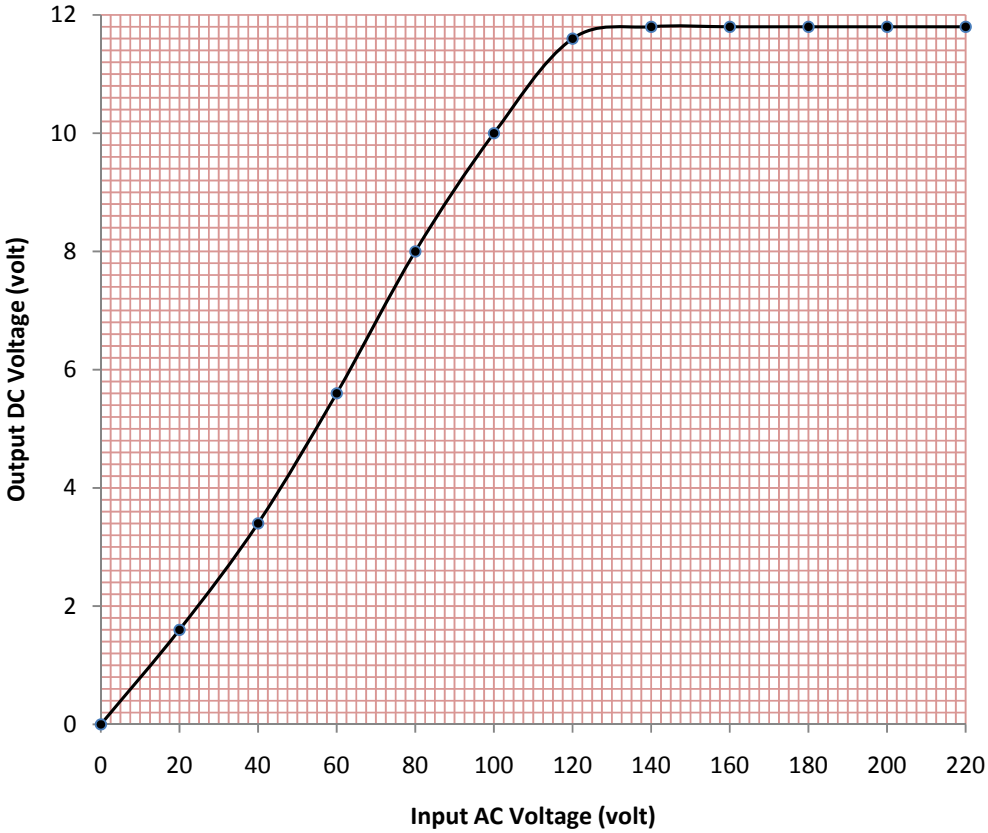
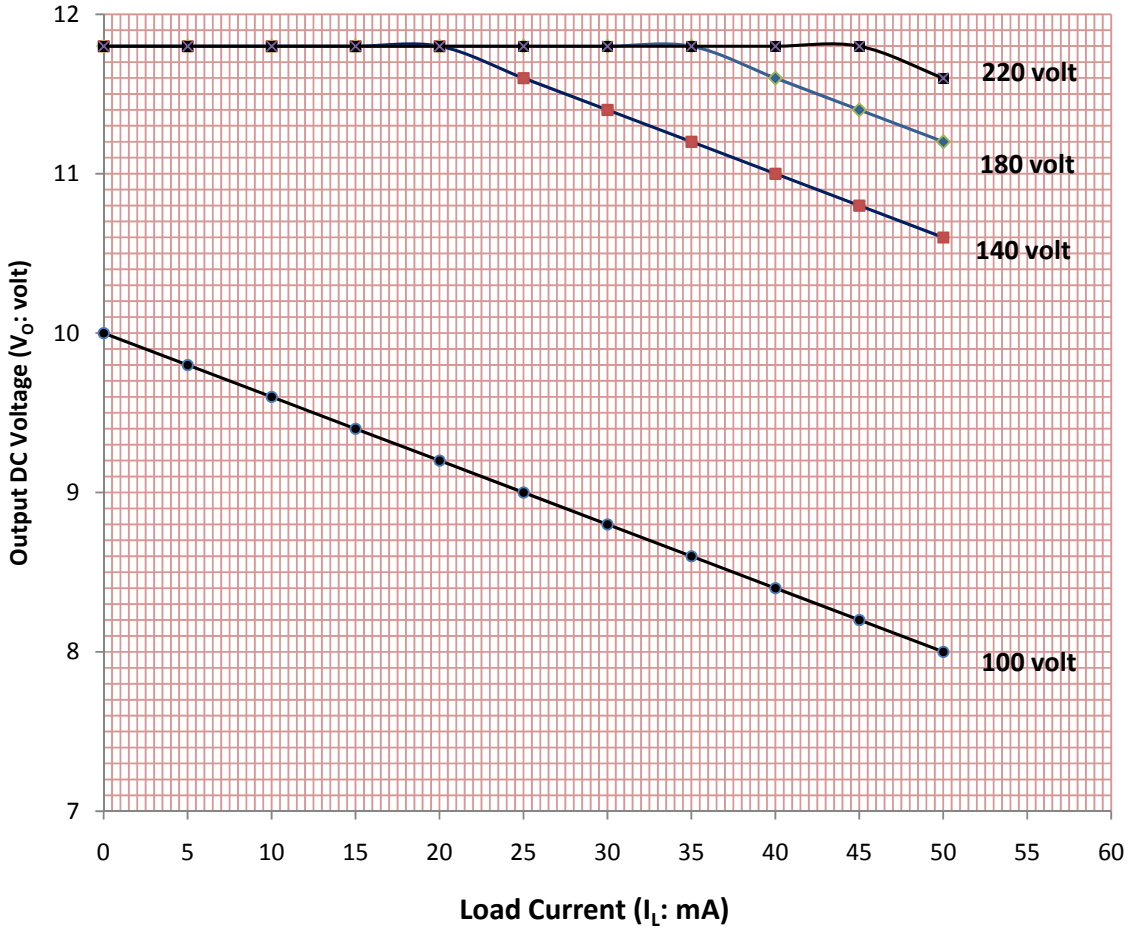
2. Table for output DC voltage with load current at different input AC voltage

Sr.No.	V_{AC}=100 volt		V_{AC}=140 volt		V_{AC}=180 volt		V_{AC}=220 volt	
	I_L (mA)	V_O (volt)	I_L (mA)	V_O (volt)	I_L (mA)	V_O (volt)	I_L (mA)	V_O (volt)
1	0	10.0	0	11.8	0	11.8	0	11.8
2	5	9.8	5	11.8	5	11.8	5	11.8
3	10	9.6	10	11.8	10	11.8	10	11.8
4	15	9.4	15	11.8	15	11.8	15	11.8
5	20	9.2	20	11.8	20	11.8	20	11.8
6	25	9.0	25	11.4	25	11.8	25	11.8
7	30	8.8	30	10.8	30	11.8	30	11.8
8	35	8.6	35	10.2	35	11.8	35	11.8
9	40	8.4	40	9.8	40	11.4	40	11.8
10	45	8.2	45	9.0	45	10.6	45	11.8
11	50	8.0	50	8.0	50	10.0	50	11.8



Graph 1: Input AC voltage verses output DC voltage



Graph 2: output DC voltage verses load current at different input AC voltage

RESULT:

1. Graph 1 shows that the output of given power supply is regulated for input AC voltage range 140-220 volts.
2. Graph 2 shows that the output of given power supply is regulated for different range of load current at different AC input voltage.
3. Graph 2 also indicates that the output of given power supply is regulated for full range of load current at 220 AC input voltage.

   Thus the output of a power supply is function input AC voltage and load current.

Precaution:

1. Connections should be jointed correctly.
2. Connections must be tight.