

## Lab Report -02

Experiment Name : To design and implement  
a full-wave bridge rectifier circuit.

Submitted by :

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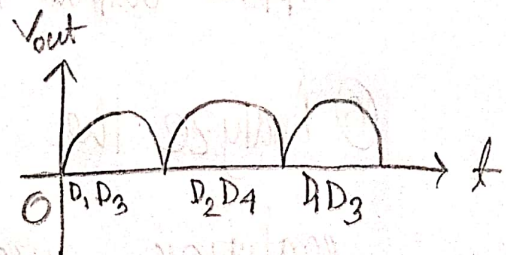
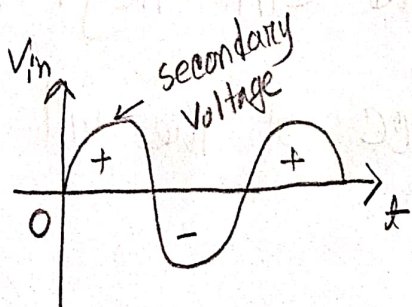
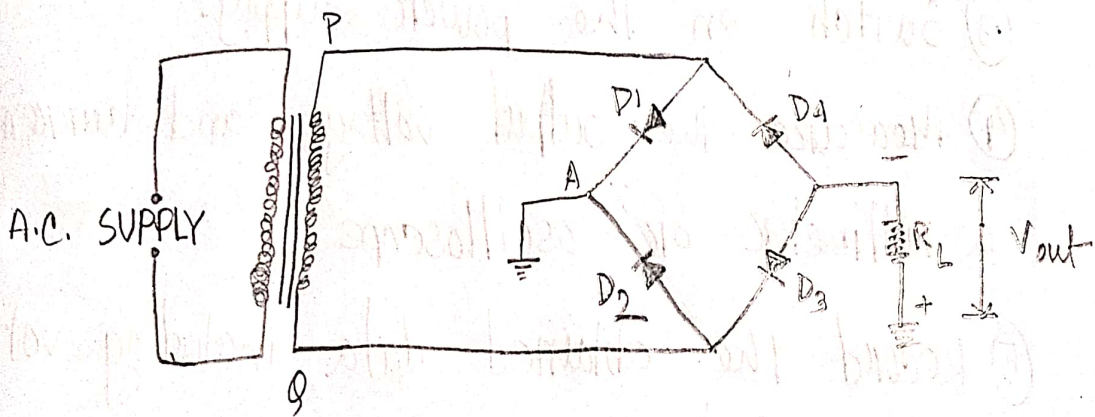
Date : 15-02-2024

Experiment Name : To design and implement a full-wave bridge rectifier circuit.

Objectives :

1. To design and analyze a full-wave rectifier circuit.
2. To determine the efficiency, ripple factor and output voltage characteristics of the circuit.

Circuit Diagram :





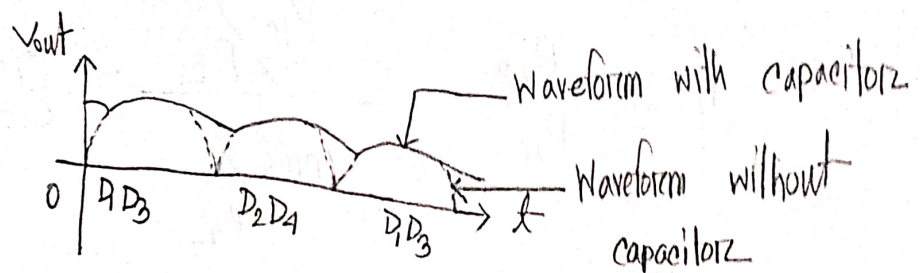
## Apparatus :

- ① Bread Board    ② Oscilloscope    ③ Resistance
- ④ Connecting wires    ⑤ Diodes (4)    ⑥ Multimeter
- ⑦ Capacitors    ⑧ Transformer    ⑨ Regulated Power Supply

## Procedure :

- ① Connect the circuit as shown in the circuit diagram.
- ② Give the input signal as specified.
- ③ Switch on the power supply.
- ④ Measure the output voltage and current using a multimeter or oscilloscope.
- ⑤ Record the obtained data including voltage ripple, output voltage and efficiency.
- ⑥ Analyze the performance of the full-wave rectifier circuit.

## Results / Data :



1. Output waveform frequency = 1 kHz

2. Output Voltage,  $V_{PI} = 1.02 \text{ V}$

$$3. V_{rms} = \frac{V_{PI}}{\sqrt{2}} = 0.721 \text{ V}$$

$$4. V_{dc} = \frac{2V_{PI}}{\pi} = 0.649 \text{ V}$$

(i) Ripple factor : Experimentally,

$$r = \sqrt{(V_{rms}/V_{dc})^2 - 1} = 0.483$$

Standard value of ripple factor is 0.482

(ii) Efficiency :

$$\eta = \frac{\text{dc power output}}{\text{ac power input}}$$

$$= \frac{P_{dc}}{P_{ac}}$$

$$= 81.2\%$$



Experimentally,

$$\eta = \frac{P_{de}}{P_{ac}} = \frac{\frac{V_{de}^2}{R_L}}{\frac{V_{rms}}{R_L}} = 80.002\%$$

Hence, The full wave rectifier circuit design output waveforms has been studied and the required parameters has been calculated.

### Discussion:

1. Compare the efficiency, ripple factor and output voltage characteristics with theoretical expectations.
2. Connections should be ~~va~~ verified before clicking run button.
3. The resistance to be chosen should be in kohm range.
4. Best performance is being obtained within 50 Hz to 1 MHz.