LAB #04-B

Objectives

1. To calculate and measure the output voltages of clamper circuits.

Theory

Clamper

Certain applications in electronics require that the upper or lower extremity of a wave be fixed at a specific value. In such applications, a CLAMPING (or CLAMPER) circuit is used. A clamping circuit clamps or restrains either the upper or lower extremity of a waveform to a fixed dc potential. This circuit is also known as a DIRECT-CURRENT RESTORER or a BASE-LINE STABILIZER.Such circuits are used in test equipment, radar systems, electronic countermeasure systems, and sonar systems.

Preparatory Exercise

Q1) What is clamping?

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Q2) Mention one application of clamping circuits.

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Requirement

Instruments

1. DC power supply
2. Digital Multimeter (DMM)
3. Function Generator
4. Oscilloscope

Components

1. Diode : Silicon (D1N4002)

2. Resistors: 10kΩ, 3.3kΩ
3. Capacitor: 100µF

The Clamper

1. Construct the circuit in *Fig.4.3*. The input signal is a 5 Vp-p triangular wave at frequency of 100 Hz. Record the measured resistance value.
2. Set the oscilloscope in DC mode.
3. Put the oscilloscope probes at function generator and sketch the input waveform obtained.

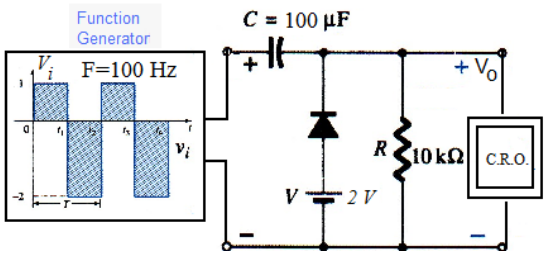


Fig 4.3

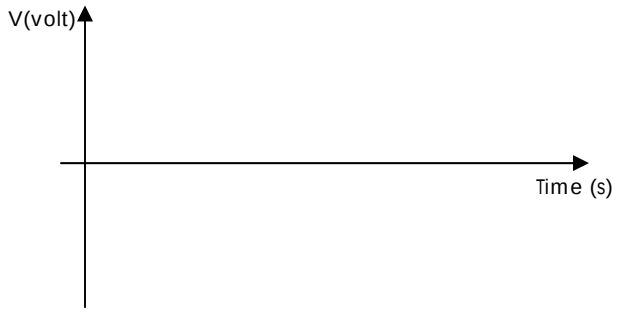
4. Sketch the output waveform obtained from the oscilloscope.
5. Reverse the diode of the circuit and sketch the output waveform.
6. Reverse the battery of the circuit and sketch the output waveform.

Observation

Results and Calculations

V_{in} square-wave

1. R (measured) = _____
2. Input waveform



3. Output waveform

V_{in} square-wave, battery reversed

4. Output waveform