

Laboratory Exercise 1

T-509-RAFT

Electronics

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Introduction

The purpose of this exercise is to examine basic diode and operational amplifier circuits. The exercise consists of several tasks; each of them requires performing the following steps:

1. Setting up a circuit,
2. Setting up supply voltages/currents and/or input signals,
3. Preparing measuring devices,
4. Taking measurements,
5. Storing the results.

Task 1: Half-Wave Rectifier

1

A half-wave rectifier as shown in figure 1 below, was built using a diode and r, $R=33k\Omega$. A sinusoidal signal of frequency 100 Hz and with a amplitude of about 2.5 V was used as the input signal, v_s .

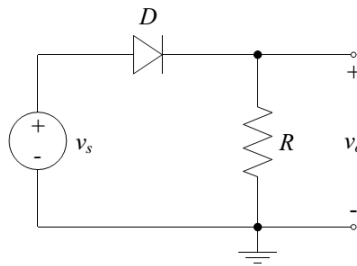


Figure 1

2

The input signal, v_s , and the output signal, v_o , were observed using the oscilloscope and the voltage drop across the diode was determined.

fig2

Using values read from the oscilloscope seen in figure 2 above, the voltage drop across the diode was determined using the following formula.

$$V_d = V_{speak} - V_{opeak} = A \text{ V} - B \text{ V} = X \text{ V}$$

3

The half-wave rectifier circuit was modified by adding a capacitor C in parallel with resistor R as shown in figure 3 below.

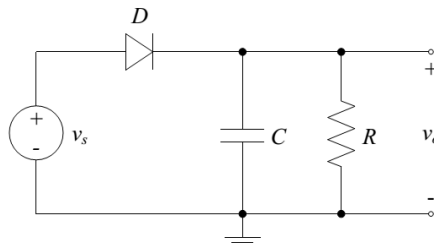


Figure 2

4

The input signal, v_s , and the output signal, v_o , were observed using the oscilloscope for the following capacitance values $C = 0.22 \mu\text{F}$ and $C = 1 \mu\text{F}$ and the ripple voltage was determined.

5

Task 2: Parameters of Operational Amplifier LM741

1

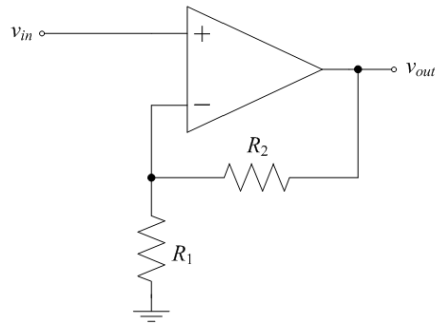


Figure 3

2

3

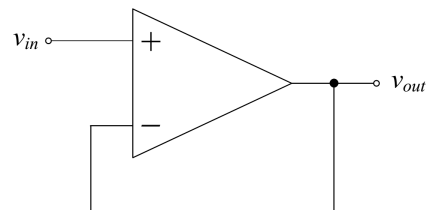


Figure 4

4