

LAB 3 Basic Characteristics of Op Amps and Comparators

PURPOSE

At the end of this lab you should know

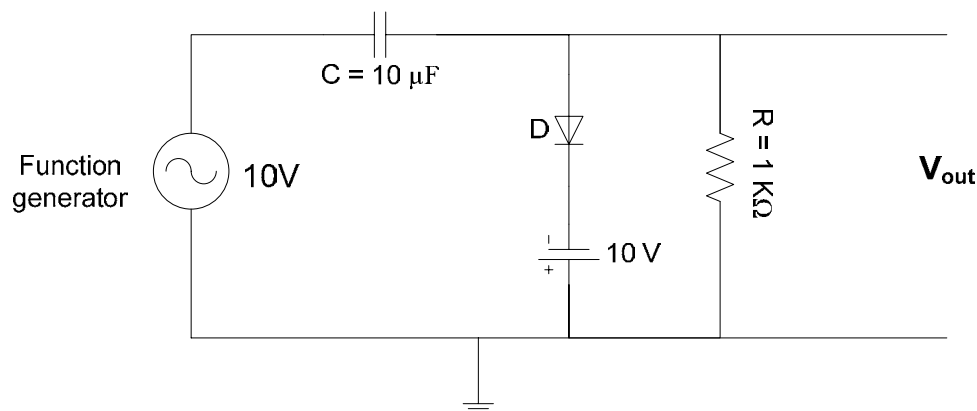
- Input-output characteristics of an op-amp
- Comparators and how an op-amp is used to construct a simple comparator

THEORY

See “Op amps” section in Experiment 4 of [1] (pg. 35 and 36)

PRELAB

1. Look up the data sheet of the integrated circuit (IC) HA17741 or UA741CN from the internet. Draw its layout as shown in Fig. 3.
2. What is the gain of an ideal op-amp?
3. Draw the output waveform for circuit in Fig. 5 if a 1 Hz sinusoidal signal is fed at the input of the op-amp. Clearly indicate the maximum and minimum amplitude of v_{OUT} .
4. What is the DC offset of HA17741 and UA741CN? How can you remove it?
5. What will be the shape of v_{OUT} if a triangular generator signal v_{SIG} is fed at the input of circuit in Fig. 8 of peak amplitude 1 V and the reference voltage V_{REF} is 0.5 V?
6. Refer to experiment 9 (pages 67-73) [1]. In step 12, give the justification of connecting a 100 Ω resistor across the power supply terminals.
7. Given a sinusoidal input waveform with a peak voltage of 10V, predict the out of the following circuit.



IN LAB PRACTICE

Experiment 4, steps 1- 14, pages 32-40

MANDATORY READINGS

Theory for lab 3

RECOMMENDED READINGS

Chapter 14 from “Electrical Engineering – principles and applications” 4th edition by Allan R. Hambley

REFERENCE

[1] Y. Tsvividis, “A First Lab in Circuits and Electronics”, (John Wiley & Sons Inc., May 2001)