ENEE2360 Project

The circuit shown in Fig.(1) is used to detect temperature changes .

The circuit uses the temperature sensor Thermistor 20K @25C^owhich has the attached specification.

If the temperature is within a specified range, the two LEDs will be off

If the temperature increases above the upper limit, the Red LED D1 will glow

If the temperature decreases below the lower limit, the Green LED D2 will glow.

Part1(Practical)

a) **Construct the circuit to verify its function.**
b) **Set Rs to 22KΩ , determine the value of Vo1,Vo2, Vo3, V(+) and V(-) of each Op.Amp. Also indicate the status of each LED**
c) **Repeat step(b) for Rs = 25KΩ and Rs = 20K**
d) **Determine the T upper limit and the T lower limit**

Part2 (Simulation and reporting)

a) **Replace the Red and Green LEDs with D1N4002**
b) **Simulate the circuit of Fg.(1) for Rs = 22K,25K, and 20K**
c) **Replacing the shaded part by a VPWL Voltage source as shown in Fig.(2) , plot Vo1(t),Vo2(t), and Vo3(t).**

d) Estimate the upper limit and the lower limit temperatures fromVo2 and Vo3(t) plots.

f) Calculate by hand the upper threshold and the lower threshold temperature.

g) Write a simple report which includes:

1 – Explanation of the function of the circuit of Fig.(1)
2 - Simulation circuits and results
3 - Comparison of simulation results to hand calculation
4 – Conclusion

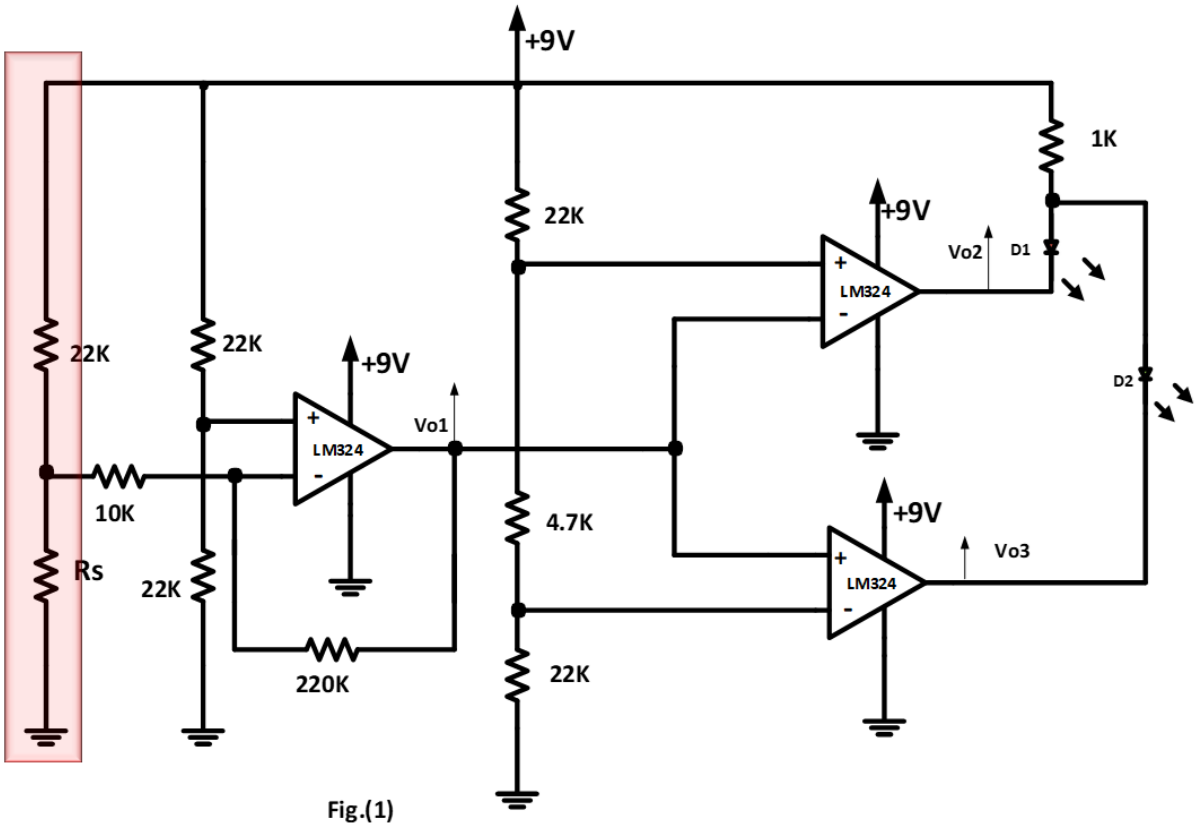

Fig.(1)

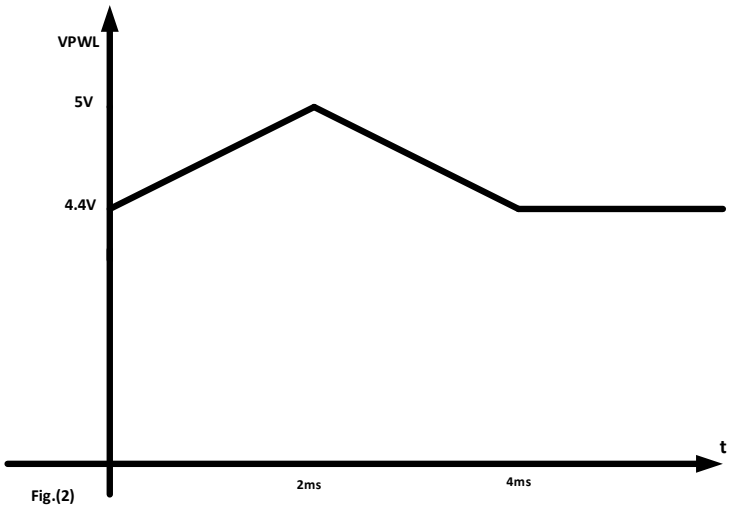

Fig.(2)

GOOD LUCK