

National Institute of Technology, Hamirpur (HP)

Name of Examination: B.Tech, End Semester Theory Examination, December-2020

Branch : Electrical Engineering

Semester : Vth

Course Name : Transducer and Signal Conditioning

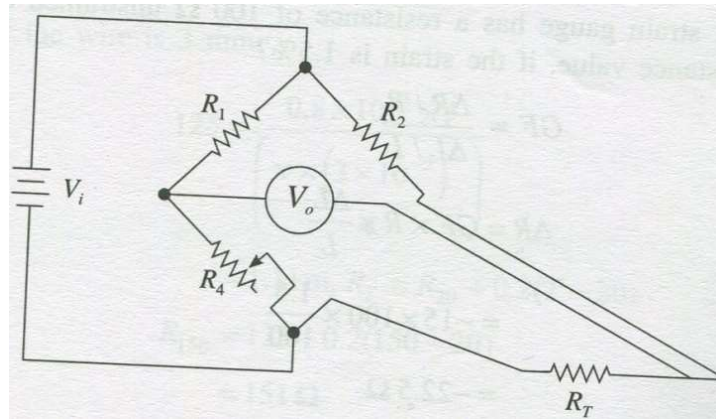
EED: 314

Time: 2:00 Hours

Maximum Marks: 50

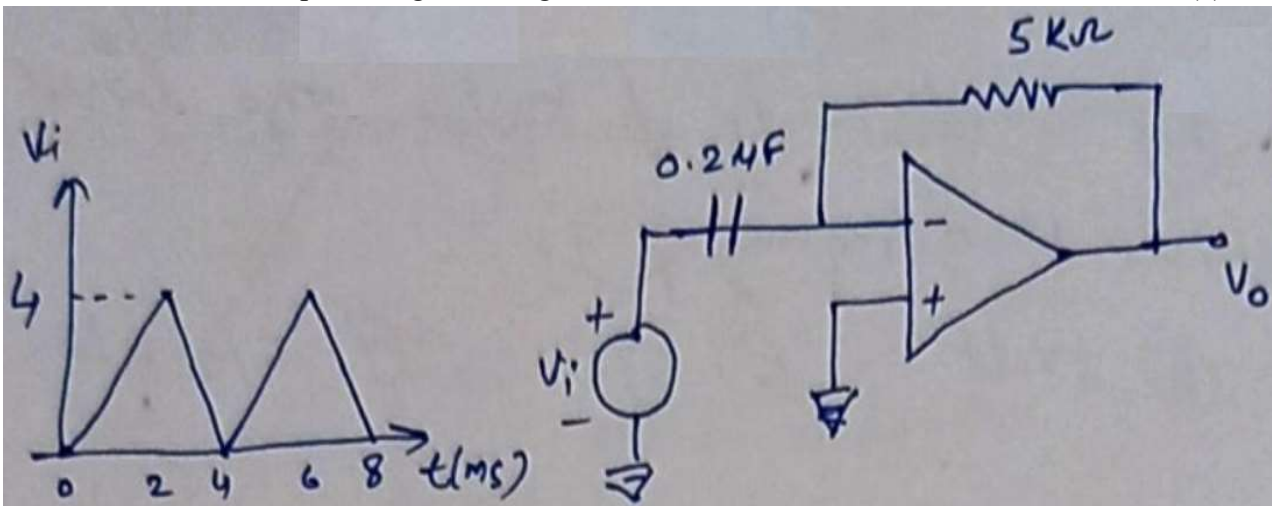
Question 1.

- (a) Explain the different methods used for measurement of humidity. (4)
- (b) Consider a piezoelectric transducer has a capacitance of 1200 pF and a charge sensitivity of 100×10^{-12} coulomb/newton. The leakage resistance of the transducer is $10^5 \text{ M}\Omega$, and the impedance of the system is $1 \text{ M}\Omega$ connected in parallel with a capacitance of 600 pF. Determine the time constant and sensitivity of the entire system. (4)
- (c) Consider the RTD circuit shown below, in which R_1 and R_2 have the values of $1.2 \text{ k}\Omega$, and the temperature range of coverage is $(0-500)^\circ\text{C}$. The resistance value of its platinum material is $1.0 \text{ k}\Omega$ at 200°C . Bridge excitation is 25 V . Determine α , and also write the expression of the output voltage. (4)

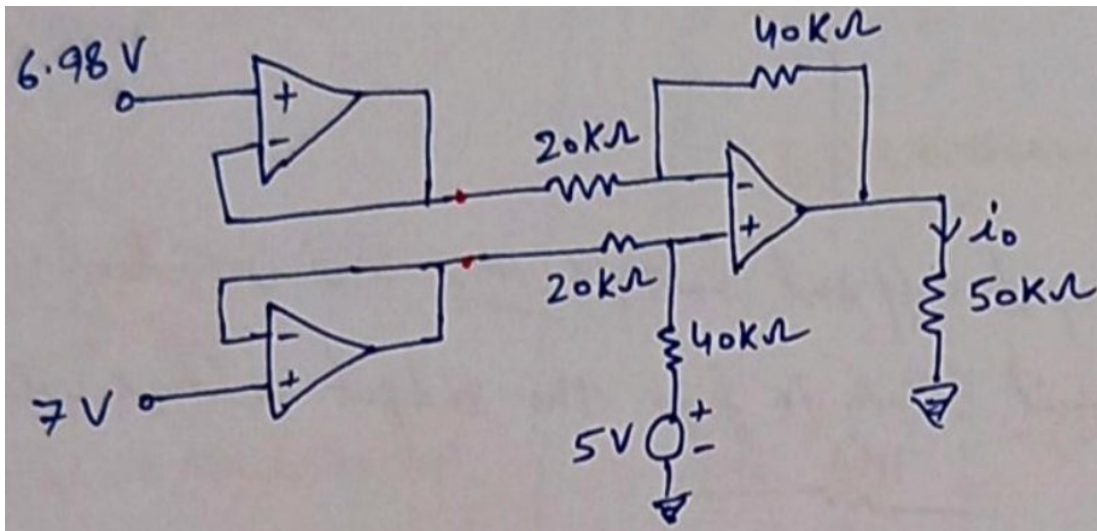


Question 2.

- (a) Explain the working of peak detector circuit. (6)
And sketch the output voltage for the given circuit.



- (b) Obtain the i_0 in the instrumentation amplifier as shown the figure bellow. (4)



Question 3. (3x4=12)

- (a) Explain the functioning of 5x7, LED matrix display.
- (b) Explain the working of digital frequency meter with suitable diagram.
- (c) How do you distinguish XY recorder from X-t or Y-t recorder? Explain with suitable circuit diagram.

Question 4. Define RF telemetry with an example. Explain time division multiplexing as applied to telemetry in detail. (8)

Question 5. What is the need of computer in the data acquisition system, explain with suitable diagram? Explain the working of 4-bit flash A/D converter with suitable diagram in detail. (8)