Measurement and Instrumentation Laboratory (EE3P005)

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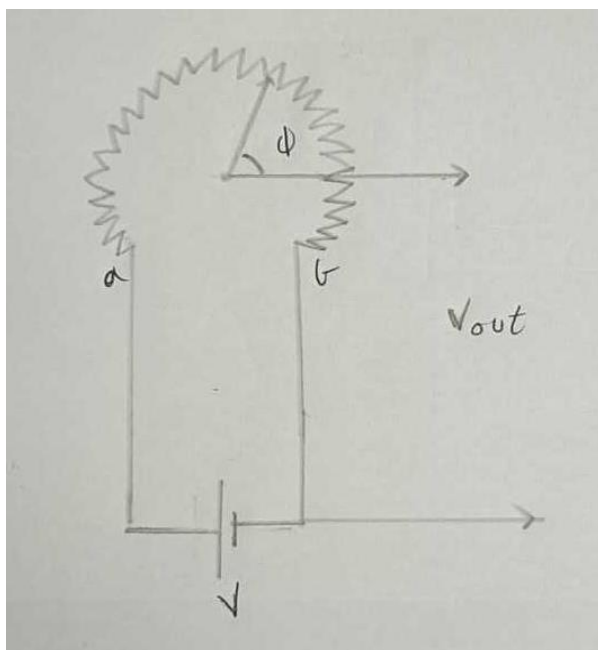*19EE01017*

Experiment-11
Angular Potentiometric Transducer

Aim:

To convert the given angle into output voltage by using Angular Potentiometric Transducer.
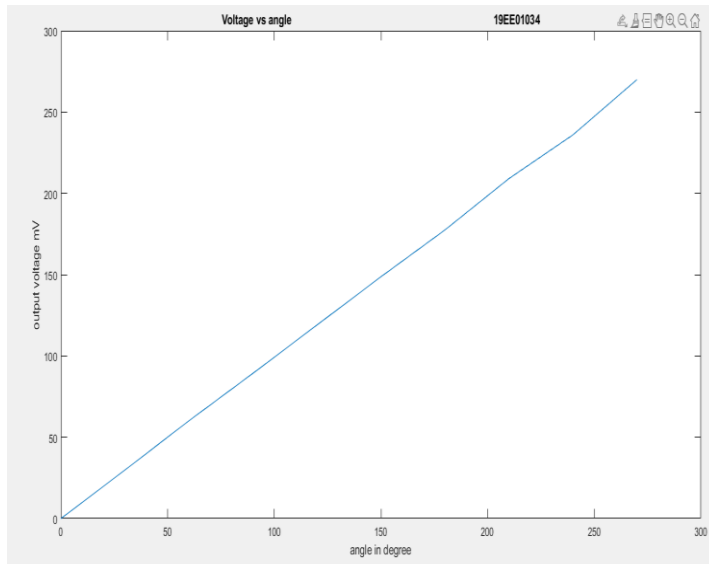
Circuit Diagram:

Observations:

Angle position (in degrees)	Output Voltage(in mV)
0	0
30	29.8
60	60.1
90	89.3
120	119
150	148.7
180	177.5
210	209.1
240	236
270	270

GRAPHS:

Output voltage vs angle

Discussion

1. What is the objective of this experiment?
A. The objective of this experiment is to understand the working of Angular Potentiometric Transducer and convert any angle into output voltage by using this transducer.

Conclusion

We Have seen the video and read the theory and understood the experiment and plotted the graph output voltage vs angle
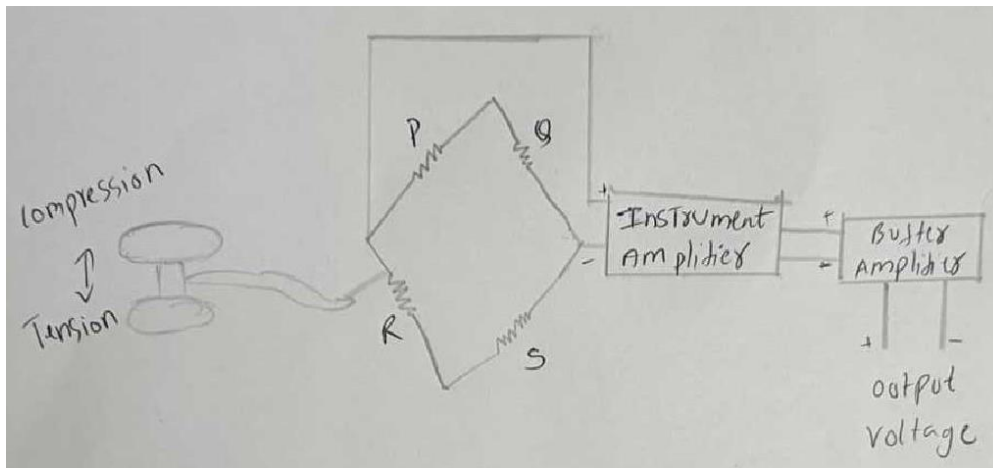
EXPERIMENT -12
STUDY OF LOAD CELL

AIM:
To Study The characteristics of Load cell
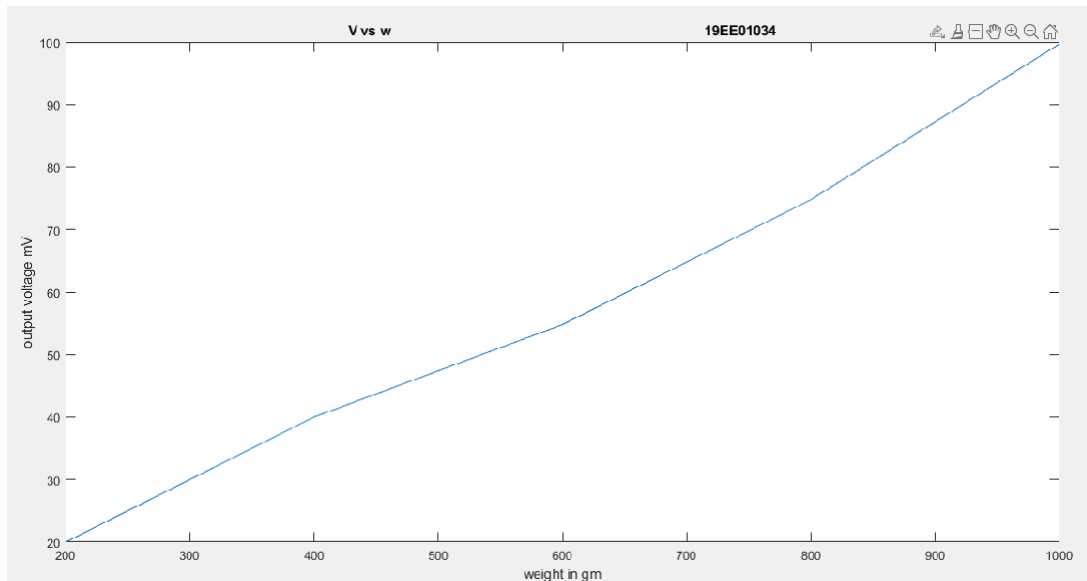
CIRCUIT DIAGRAM:

OBSERVATIONS:

For Compression:

Sl. No	Weight (ingm)	DPM reading	Output Voltage (mV)
1	200	201	20
2	400	401	40
3	600	600	54.8
4	800	801	74.8
5	1000	1000	99.7

For Tension:

Sl. No	Weight (ingm)	DPM reading	Output Voltage (mV)
1	200	-200	-20
2	400	-402	-40.1
3	600	-601	-60
4	800	-801	-80
5	1000	-1002	-100

GRAPHS:

Output voltage vs weight
compression

Output voltage vs weight
Tension (elongation)
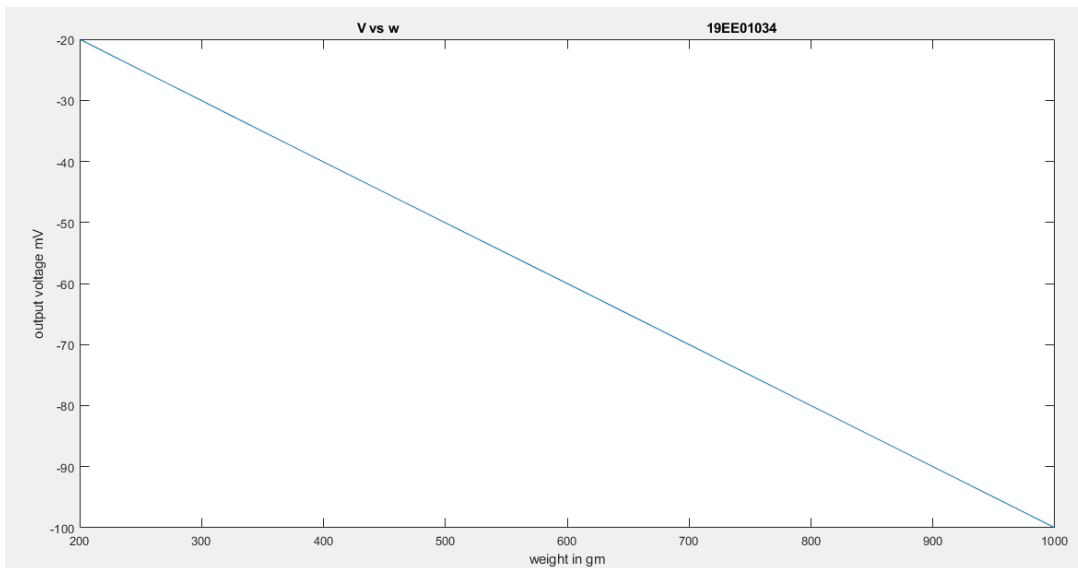
DISCUSSION

1. What is the objective of this experiment?

The objective of the experiment is:

a) To measure the total tension or compression exerted by a load using Load Cell Transducer.
b) To study the working principle of Load cell.

2. Briefly explain how a strain gauge transducer is used here to measure load.

A Strain gauge is a sensor whose resistance varies with applied force. It converts force, pressure, tension, weight, etc., into a change in electrical resistance which can then be measured.

A strain gauge works on the principle of electrical conductance and it is dependent on the conductor's geometry. Whenever we apply a force or load on strain gauge, the conductor gets stretched and it becomes narrower and longer. Similarly, when it is compressed, it gets shorter and broader, ultimately changing its resistance.

We know, resistance is directly dependent on the length and the cross-sectional area of the conductor. The change in the shape and size of the conductor also alters its length and the cross-sectional area which eventually affects its resistance.

If the conductor is stretched by n times, then its resistance will increase by n^2 times (since length increases and area decreases). This change in resistance is measured by wheat-stone bridge. Since the change is very small, the output is amplified by instrument amplifier and it is fed to buffer amplifier to keep the output voltage steady and constant. Thus, the amount of load applied is directly proportional to output voltage.

In this way, strain gauge transducer is used to measure load.

CONCLUSION

We Have seen the video and read the theory and understood the experiment and plotted the graph