

*MADHAV INSTITUE OF TECHNOLOGY AND SCIENCE, GWALIOR*

**SENSOR TECHNOLOGY**

ASSIGNMENT 7



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Submitted to:

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*1. What is Strain & Strain Gauge?*

**Strain** is the amount of deformation of a body due to an applied force. More specifically, strain (e) is defined as the fractional change in length.

E= dL/L

A **strain gauge** is a thin, wafer-like device that can be attached to a variety of materials to measure applied strain.

*2. Explain in brief operation of Strain Gauge.*

Working:

When an object deforms within the limit of elasticity, either it becomes narrower and longer or it become shorter and broadens. As a result of it, there is a change in resistance end-to-end.

By measuring the change in resistance of an object, the amount of

induced stress/strain stress/strain can be calculated. The change in resistance normally has very small value, and to sense that small change, strain gauge has a long thin metallic strip arrange in a zigzag pattern on a non-conducting material called the carrier.

*3. Write down the Applications of a Strain Gauge.*

**Aerospace Applications** – strain gauges are bonded to load-bearing components within air crafts to measure any strain and stress which takes place within various areas during flight.

**Rail applications** – strain gauges can be bonded to the railway lines themselves to monitor and measure the stress the lines are under.

**Use within Load Cells** – strain gauges are used within load cells, the measure the strain and stress the load cell is under to determine weight and quantities.

**Measuring stress on circuit boards** – some very small strain gauges can measure stress on electric circuit boards and other confined spaces.

**Residual Stress monitoring** – this is a very broad term and can refer to monitoring stress in casting, welding and formation processes during manufacturing.

Other applications:

Testing ships hulls

Vehicle testing applications

Structural component testing

Construction applications