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18/ENG02/003
COMPUTER ENGINEERING

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EEES17
MEASUREMENT AND
INSTRUMENTATION

NUMBER 1

i) A Sensor is a device module, machine or subsystem whose purpose is to detect Circuit in its environment and send the information to other electronics. A sensor is always used with other electronics.

- eg
- proximity Sensor
 - temperature Sensor
 - Accelerator
 - Pressure Sensor
 - IR Sensor
 - Light Sensor

ii) An actuator is a component of a machine that is responsible for moving and controlling the system. In example form, it is a "mover". An actuator requires a control signal and a source of energy.

Examples are:

- Comb drive
- Digital micromirror device
- Electronic motor
- Hydraulic cylinder
- Electroactive polymer

18/01/2023
Productive subvator

NUMBER 2

2a) Vector Sensors

This was underwater listening device used to detect sounds in water and convert acoustic energy into electrical energy. Vector Sensor differs from hydrophones, which are also underwater listening devices, in that Vector Sensors measure both the particle motion and pressure changes associated with a sound wave, while hydrophones measure only the pressure changes.



Vector Sensors

B STRAIN GAUGE

A strain gauge is a device used to measure

c) Digital Indicator

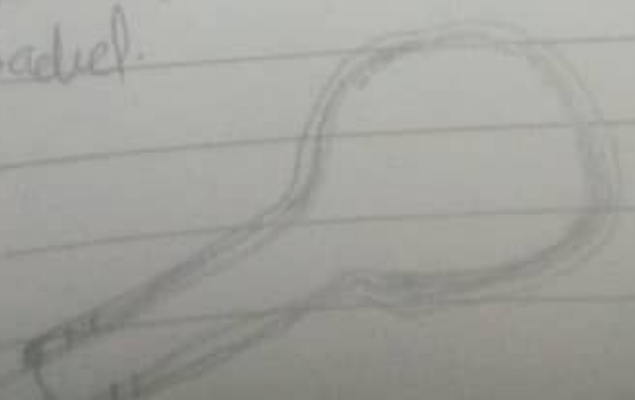
These are flexible devices which can be used in many different fields such as industry and research as well as a wide variety of measurement works. They also allow the user to view diverse parameters such as temperature, humidity, vibration, Normalized Signal etc.



Digital Indicator

d) force sensor

This weigh freight on manufacturing and transportation equipment they also monitor loads on machines subject to stringent safety standards such as mine lifts, construction, cranes, industrial tanks, grain silos, and locomotives to ensure equipment is not overloaded.



Force Sensor

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2a. NUMBER 3

18/ENG001/003

Dialysis is the process of removing excess water solutes from blood whose kidneys can no longer perform their functions properly.

This is referred to as renal replacement therapy. Dialysis may need to be started when there is

sudden loss of kidney function, which is known as Acute Kidney.

Principle

Dialysis work on the principles of the diffusion of solutes and ultrafiltration of fluid across a semi-permeable membrane. Diffusion is a property

of substances in water. Substances in water tend to move from an area of high concentration to an area of low concentration.

* Passive diffusion occurs when a high to low concentration gradient is present between the patient's blood and dialysis solution (dialysate) used.

Ultrafiltration ensures excess fluid is cleared from the body through the use of a positive (blood) or negative (dialysate) pressure gradient, moving fluid from a high to low pressure region.

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The main types of RRT established renal failure are.

- Haemodialysis (HD)
- Haemodiafiltration (HDF)
- Peritoneal dialysis (PD)
- Kidney transplantation

3B. An endoscope is an illuminated optical, typically slender and tubular instrument. A type of bore scope used to look deep into the body and used in procedures called an endoscopy. Endoscopes are tubes which are only a few millimeters thick to transfer illumination in one direction and high resolution images in real time in the other direction, resulting in minimally invasive surgery.

Principle

The endoscopy procedure uses an endoscope to examine the interior of a hollow organ.