

Measurement and Instrumentation

- 1) Error analysis.
- 2) Electromechanical Instrument.
- 3) Measurement of R, L, C.
- 4) CRO
- 5) Digital Instruments.
- 6) Instrument Transformers.
- 7) Potentiometer and Q-meter (ESE)
- 8) Transducers. (ESE).

- weightage : 3-4m.

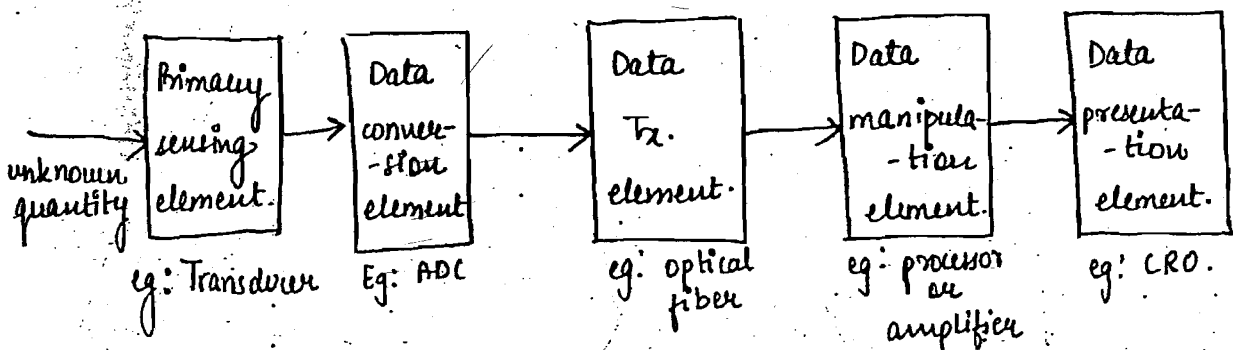
Measurement

Measurement is a process in which an unknown quantity is compared with a known quantity or standard.

Lecture - 1

distance = 5 km
= 5 times \downarrow km
standard.

Instrument : Instrument is a device which is used to measure a quantity.



- Primary sensing element is in direct contact with the quantity under measurement and it converts a non-electrical quantity into electrical quantity.
- Data conversion element converts the information into another form such as analog to digital for better processing.
- Data Tx. element is used to transmit the data from remote location to a sub-station for processing. (Telemetry)
- Data manipulation element process the data to change the level or freq. of signal for better presentation.
- Data presentation element displays the data in a user friendly manner.

Static characteristics of measurement system :

- These characteristics are studied when the quantity under measurement doesn't vary with time or the pointer of the instrument is settle down to a steady state.

① Accuracy and Precision :-

True value : actual value.

Measured value : reading of instrument.

experiment :

A	B	true value
3.01V	4.1V	= 4V
3.02V	4.0V	
3.00V	4.3V	
3.05V	4.6V	
2.99V	4.9V	
(more precise)	(more accurate)	

- accuracy is the measure of degree of closeness of the measured value with the true value.