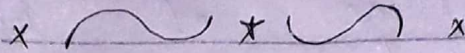


Name :- Muhammad Ali
ID :- 6964
Subject :- Instrumentation
& Measurements
Module :- 6th (BE)

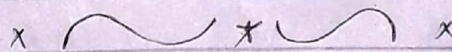


Q1:-

a)

Ans:-

In order the ammeter has a very low resistance. If we put it in parallel in a circuit, it can draw a heavy current which can result in burning of moving coil or any thing connected to it and if we put a extremely low resistance which may be shunt resistance it may be control to some extent.



Q2:-

b)

Ans:-

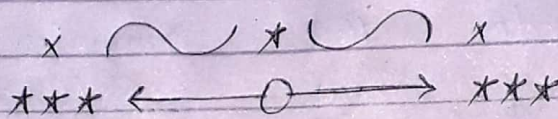
As voltmeter is a device used for voltage measurement. And in order if we connect it in series a very small current will flow or may be no current will flow across the circuit.

Muhammad Ali

ID (6964)

(2)

Ideally "voltmeter" ~~idea~~ have infinite internal resistance, practically a large enough resistance. Since no current flowing, voltmeter will show the voltage of battery connected across.



Q2:-

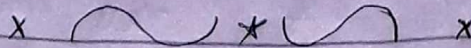
a)

Ans:-

A random error, as the name suggests, is random in nature & very difficult to predict.

It occurs because there are a very large number of parameters beyond the control of the experimenter that may interfere with the result of the experiment.

Random errors are caused by sources that are not immediately obvious & it may take a long time trying to figure out the source for which it cannot be reduced easily in measurement.

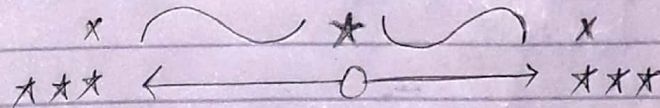


Q2:-

b)

Ans:-

Gross errors are caused by mistake in using instruments or meters. Calculating measurement & recording data results. The example is that a person is measuring pressure that is 1.01 N/m^2 and he writes note it 1.10 N/m^2 . It may also be caused due to the lack of mind or attentive which can represent a wrong data at a later time. which can be reduced in deviating the main results and the end of final results. So the main reasons due to which it is caused are "instruments" & "measurements".



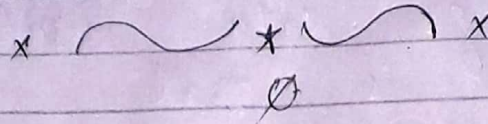
Q3:-

a)

Ans:-

They are torsional springs providing the restoring force that pushes the pointer back to zero. It is the hair springs that make the deflection

proportional to the force.
And since the force is
proportional to the current
it permits us to draw
an analogue scale under
the pointer & measure
the current.



Q3:-

b)-

Ans:- Given:-

$$\text{Current} = I_g = 10 \mu\text{A}$$

$$\text{Voltage} = V = 20\text{V}$$

Required:-

$$R = ?$$

Solution:-

$$\therefore V = IR$$

$$\therefore V = I_g(G+R)$$

$$V = I_g(G+R) \quad \therefore G \text{ is neglected.}$$

$$\frac{V}{I_g} = (G+R)$$

$$\frac{20}{10 \times 10^{-6}} = R$$

$$2 \times 10^6 \Omega = R$$

$$\Rightarrow R = 2 \text{ Mega } \Omega$$

OR

$$\Rightarrow (R = 2 \text{ M}\Omega)$$