Department of Electrical Engineering
Assignment
Date: 20/04/2020

Course Details

Course Title: Instrumentation and Measurement **Module:** 6th (BE)
Instructor: Engr Waleed Jaan **Total Marks:** 30

Student Details

Name: Idrees Iqbal **Student ID:** 13171

Q1.	**(a)**	A student mistakenly connects an ammeter in parallel in a circuit. What will happen? Explain briefly.	**Marks 05** **CLO 2**
	(b)	A student mistakenly connects a voltmeter in series in a circuit. What will happen? Explain briefly.	**Marks 05** **CLO 2**
Q2.	**(a)**	Random error cannot be easily reduced in measurements. Justify this statement.	**Marks 05** **CLO 1**
	(b)	What are the different reasons due to which gross error occurs in measurement? Explain briefly.	**Marks 05** **CLO 1**
Q3.	**(a)**	What will happen if a spring in not connected with the coil of a moving coil galvanometer? Explain briefly.	**Marks 05** **CLO 2**
	(b)	A student is performing an experiment in the laboratory during which he finds out that the measuring instrument is giving a Full Scale Deflection for a current of 10 μ A. He wants to measure a voltage of 20V with the help of this measuring instrument. Now, What should be the appropriate value of the resistor to be added with this instrument so that it can measure up to 20V? Moreover, should the resistor be connected in series or parallel with this instrument?	**Marks 05** **CLO 02**

Name IDREES IQBAL ID 13171 Paper EMI

Sole 1 Part a

A student mistakenly Connect an ammeter in parallel in a circuit what will happen? Explain briefly.

Ans)

An ideal Ammeter has zero Resistance on other hand a non-ideal ammeter has Very Small Resistance.

When we Connect an ammeter in ~~para~~ parallel in a Circuit. we we know that Current always follows least Resistance path. maximum amount of Current will flow through the ammeter which in turn will burn the ~~fuse~~ fuse or Can damage the the ammeter.

Therefore in electrical engineering labs, important precautions while connecting the Circuits are.

* Connect the ammeter in series

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Q No 1 Part b)

Q) A Student mistakenly Connect a Voltmeter in series in a Circuit, What will happen? Explain briefly.

Ans) An ideal Voltmeter have infinite Resistance. So it is clear that it will block the current. Voltmeter are arranged in parallel. But current Chooses a path of low Resistance in parallel Circuit.

The Connecting of Voltmeter in series is equivalent to connecting a very high resistance in series with the circuit. By this only small insignificant amount of current flows through the Circuit and nearly result in an open Circuit

Important precaution:

* Connect the same Voltmeter in parallel.

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Q No 9)

Q. ? Random error Cannot be easily reduced for measurment. Justify this statement.

Ans) A Random error makes the measurment value both smaller and larger than the true value. they are errors of precision. Random errors occur by Chance and Cannot be avoided. Random error is due to factor. which we do not or Cannot Control.

Example of Cause of random error are electronic noise in the circuit of an electrical instrument.

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Q No 2 b)

What are different reason due to which gross error occurs in measurment. Explain briefly.

Ans)

Gross error are caused by mistaken in using instrument or meters calculating measurment and recording data result. This may be the reason for gross error in the recorded data and such error may end up in calculation of the final result. thus deviating result.

* These errors usually occur because of human mistakes and these may be of any magnitude and cannot be subjected to mathematical treatment

* one common gross error is frequently committed during improper use of the measurment instrument

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Q.No 3 (a) What will happen, if a spring is not connected with the coil of a moving coil galvanometer. Explain briefly.

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 and the pointer and measure the current

They are normally two. They provide the electrical connection to the coil on the ammeter. They fixed to moving connection

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Q No.3 part b)

Given data

$I_g = 10\mu A$

$V = 20V$

$G = 0\Omega$ because G is neglected

Required

$R = ?$

Solution:

$$V = i_g (G+R)$$

$$\frac{V}{i_g} = G+R$$

$$\frac{V}{i_g} = G = R$$

$$R = \frac{V}{i_g} - G$$

$$R = \frac{20}{10 \times 10^{-6}} - 0$$

$$R = \frac{20}{0.00001}$$

$$R = 2000000$$

$$\boxed{R = 2M\Omega}$$

AND the resistor will be connected in series