

Department of Electrical Engineering

Assignment

Date: 20/04/2020

Course Details

Course Title: Instrumentation and Measurement  
Instructor: \_\_\_\_\_

Module: 6<sup>th</sup> (BE)  
Total Marks: 30

Student Details

Name: AQIB SHUKAIB Student ID: 6978

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

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①

Question 1:- (a)

If a student connects an ammeter parallel in an Electric Circuit it will short the load and damage the ammeter.

An ammeter has a very low resistance. If its used in a parallel circuit it may draw a heavy current which will result in burning of the moving coil. Unless we have put an extremely low resistance as a shunt to the ammeter. Due to high current flowing through the ammeter it will short out load.

(b) If a voltmeter is connected in series a very small amount of current will flow or no current will flow in a circuit due to high resistance of voltmeter.

Voltmeter has a very high resistance to ensure that its connection doesn't alter flow of current in a circuit. Now if we connect it in series then no current will be there in the circuit due to high resistance.

x ————— x ————— x



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(2)

## Question 2 (a)

We cannot reduce error in the measurement because it can be too expensive to control them in each time they are taken.

They are caused by the unknown and unpredictable changes in the experiment measurements.

(b) Gross errors are caused due to carelessness, failure of equipments, calculating wrong measurements or recording wrong data results.

The best example of this error is if suppose an operator is reading pressure gauge  $1.01 \text{ N/m}^2$  as  $1.10 \text{ N/m}^2$ . so it will be due to the operators error. This may be the reason of Gross error in the reporting data.

x ————— x —————

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③

Question 3 (a) :-

If the spring is not connected with the coil of a moving coil of galvanometer then the pointer comes back to zero.

In Galvanometer the spring provides the restoring force pushed the pointer back to zero. It is the hair springs that make the deflection proportional to the force and the force is proportional to the current. It permits to draw an analog scale under the pointer and measure the current.

Question 3 (b)

Given Data :-

$$I_g = 10 \times 10^{-6}$$

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

Required Data :-

$$R = ?$$

Sol :-

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

$$V/I_g = G + R$$

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(4)

$$R = V/I - G$$

$$R = 2000000$$

$$R = 2 \times 10^6 = 2 \text{ Mega } \Omega$$

So the Total resistance is  $2 \text{ Mega } \Omega$

Voltage =  $20V$  and they are connected in series.

