Al-Mustaqbal University
Department of Medical Instrumentation Techniques Engineering
Class: second
Subject: Measurements & Medical Transducers
Lecturer: Sukaina Gassan & Raghad Emad
Experiment NO.1

Object :

to study the loading effect of voltmeter.

Theory :

The sensitivity of a D.C voltmeter is an important factor when selecting a meter for a certain voltage measurement . A low sensitivity meter give correct reading when measuring voltage in low voltmeter when connected across two point in a high resistive circuit , acts as a shunt for that portion of the circuit and thus reduces the equivalent resistance in that portion of the circuit .

The meter will then give a lower indication of the voltage drop than actually existed befor the meter was connected . the effect called loading effect of an instrument it is caused principally by low sensitivity instrument . the internal resistance of the voltmeter is :

$$Rın = S \times \dot{V}ran\dot{g}e$$

Where S= sensitivity of the voltmeter = (I/Im)Ω/v

Procedure :

1.Connect the circuit shown in fig.(1).

2.Measure the voltage of R2 using voltmeter of 20 K Ω/V sensitivity on scale 10 v

3.Repeat step 2 using scale greater than 10 V

4.Connect the circuit shown in fig .(2) Repeat step 2.

Discussion :

1.what are the reasons of the difference between the reading of step 2 and step 3?

2.Derive the unit of the sensitivity .

3.how we can minimize the loading effect on voltmeter ?

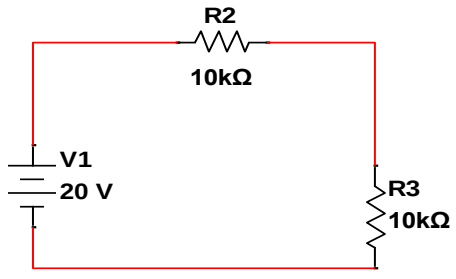

Fig.1

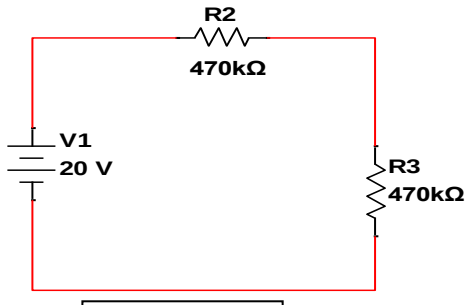

Fig.2

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