BE LAB TASK # 05

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TOPIC: SERIES AND PARALLEL COMBINATION CIRCUIT.

TASK:

OBSERVATION/CALCULATIONS:

Objectives:

A, Identify series and parallel combination circuits.

B, Measure the Current Flow in a Series Circuit using Ammeter.

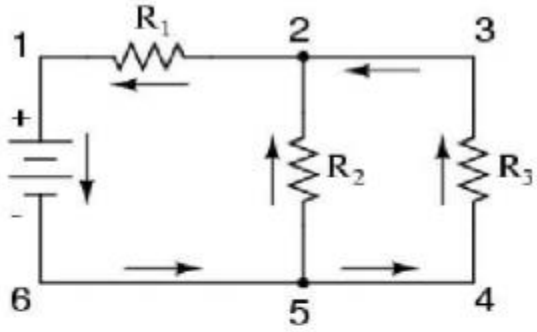
C, Find out the Current Passing through the R6, R4 and R5.

D, Measure the voltage drop across each individual resistor using Digital Multi-meter.

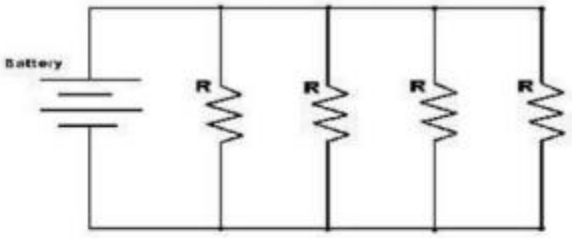
On Next Page.

Objectives A:

A, Identify Series and parallel combination circuit.



(a)



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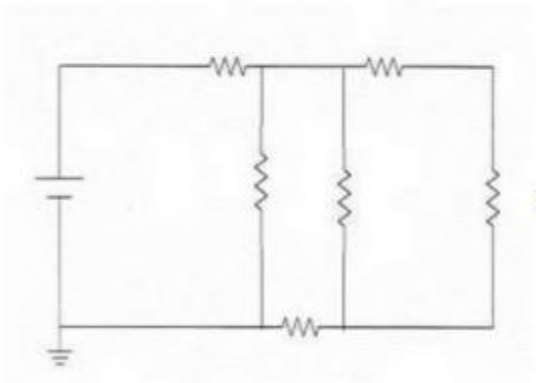

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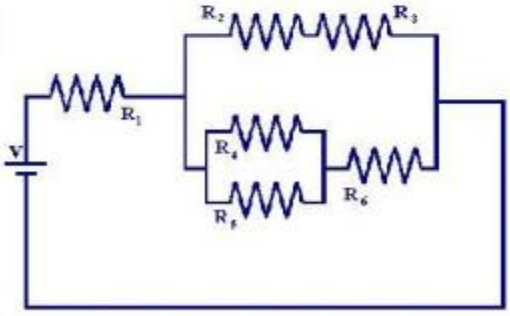


(d)

Answer: a, c, d

Objective B:

B, Measure the Current Flow in a Series Circuit using Ammeter.

- Connect the circuit shown in Fig-1. Note that the ammeter, set to the 0-100mAdc range, must be connected in series to measure the total circuit current.

  I_T= 27.023 mA DC.
- Adjust the voltage 15 V.
- You can also find total circuit resistance by Ohms law. As you have been already told in theory class how to find the total resistance in Series-parallel circuit. Find out the total resistance of Fig shown below.
- Answer:
- ***Calculating Circuit Resistance by Ohm's Law:***
- Solution:
- V=IR.

  15V=(0.027023 A) x R.

  R=555.082 Ohms.
- ***Total Resistance of Fig shown step by step also:***
- Solution:
  1. Sir's Values for Resistors:

     R1 = 1000 Ohms.

     R2 = 250 Ohms.

     R3 = 250 Ohms.

     R4 = 100 Ohms.

     R5 = 750 Ohms.

     R6 = 300 Ohms.
  2. First Considering R1, R2, R3 for Calculations:

     R1 = 1000 Ohms.

     R2 = 250 Ohms.

     R3 = 250 Ohms.

     a. Solving R2, R3 first as they are in Series:

        R23=R2+R3.

R23=250+250.

R23=500 Ohms.

b. Now solving for R1 and R23 as now they are in parallel now:

1/R123=1/R1+R23.

1/R123=1/1000+1/500.

1/R123=3/1000.

R123=333.334 Ohms.

3. Now Considering R4, R5, R6 for Calculations:

R4 = 100 Ohms.

R5 = 750 Ohms.

R6 = 300 Ohms.

a. Solving R4 and R5 first as they are in series:

R45=R4+R5.

R45=100+750.

R45=850 Ohms.

b. Now solving for R45 and R6 as now they are in parallel:

1/R456=1/R45+1/R6.

1/R456=1/850+1/300.

1/R456=23/5100.

R456=221.734 Ohms.

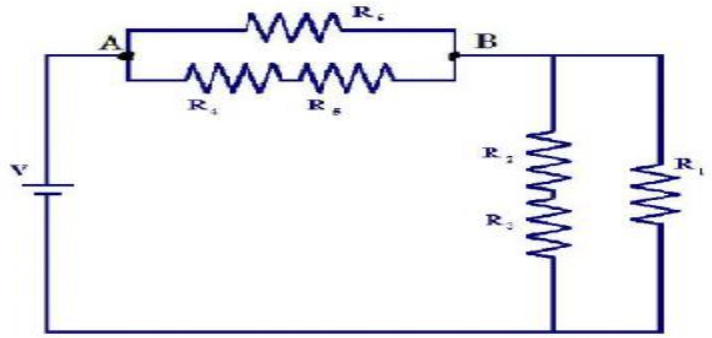
4. Now Total Resistance of Circuit “RT”:

*Since R123 and R456 are now in series so:

RT=R123+R456.

RT=333.334+221.734.

RT=555.068 Ohms.



Objective C:

C, Find out the current passing through the R6, R4 and R5.

$I_{R6\text{-}PointB}$ = 19.974 mA DC.

$I_{R4\text{-}R5}$ = 7.05 mA DC.

$I_{R5\text{-}PointB}$ = 7.05 mA DC.

Objective D:

D, Measure the voltage drop across each individual resistor using the Digital Multi-Meter.

V_{R1} = 9.008 V DC.

V_{R2} = 4.504 V DC.

V_{R3} = 4.504 V DC.

V_{R4} = 0.704 V DC.

V_{R5} = 5.287 V DC.

V_{R6} = 5.992 V DC.

- Calculate the Total circuit current of above figure.

I_T = 27.023 mA DC.

Proof:

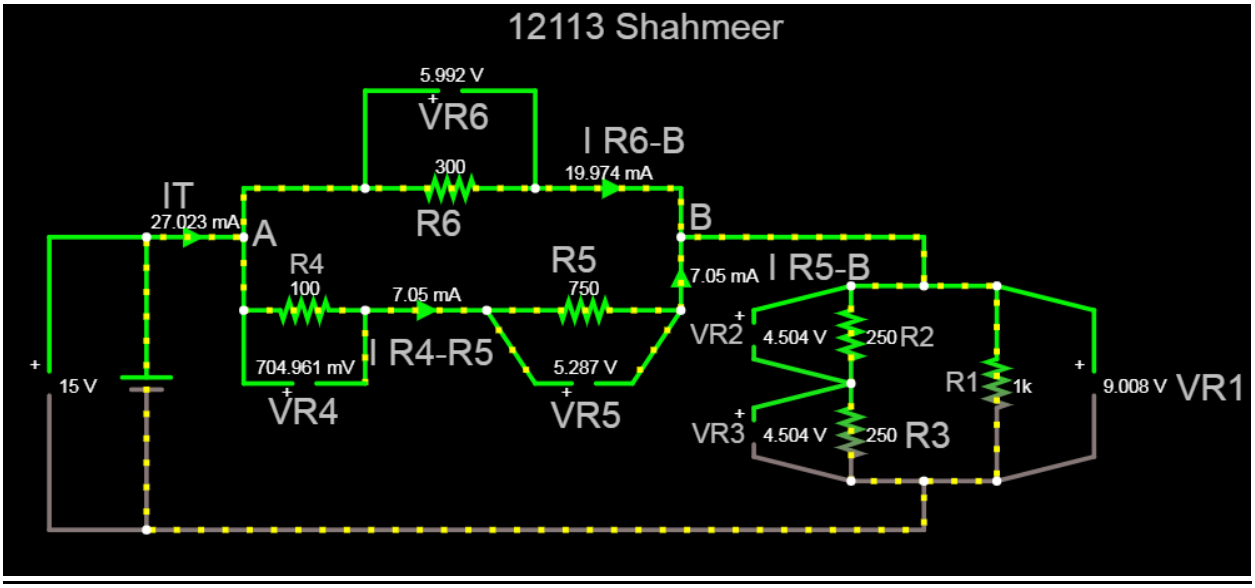
VT=IT RT

15/0.555068 = RT

IT=27.023 mA DC.

- Is it easy to work with series-parallel circuit together, instead of creating separate series and parallel circuit(if No, Justify)?
  Answer: No, Because the calculations in Series-Parallel Circuits are complicated as compare to the separate series and parallel circuits.

Screenshot:



Link:

https://tinyurl.com/y5qvd9ww