BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

Yelahanka, Bengaluru-64

DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING

Course Name: Network Theory	**Course Code:** 18EC32	**Sem:** III ETE
Course Coordinator: Mr. Siddiq Iqbal	**Date:**09/04/2022	**Academic Year:** 2021-22

CO5: conduct experiments and analyze on network theorems, prepare report for the same. **POs:** 5, 9,10,12 **PSOs**-1

"Modern Tool- Multisim"

Prepared by: S VARSHA (1BY20ET048)

Contents:Superposition Theorem

Thevenin's Theorem

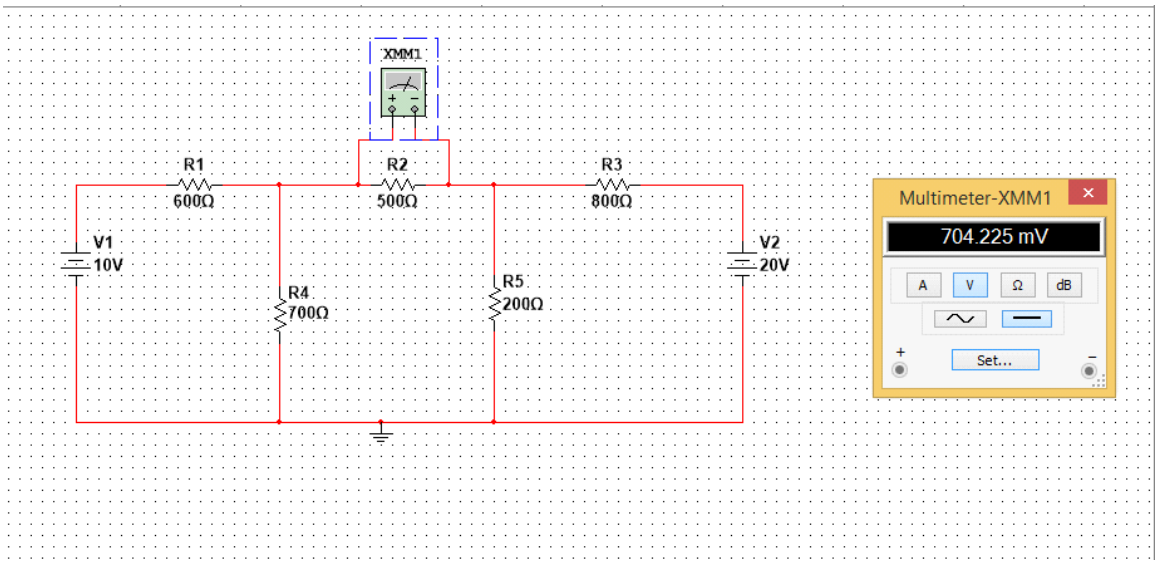
Norton's Theorem

Superposition Theorem:

In any linear circuit, containing multiple independent,the current or voltage at any point in the network maybe calculated as algebraic sum of the individual of each source acting alone.

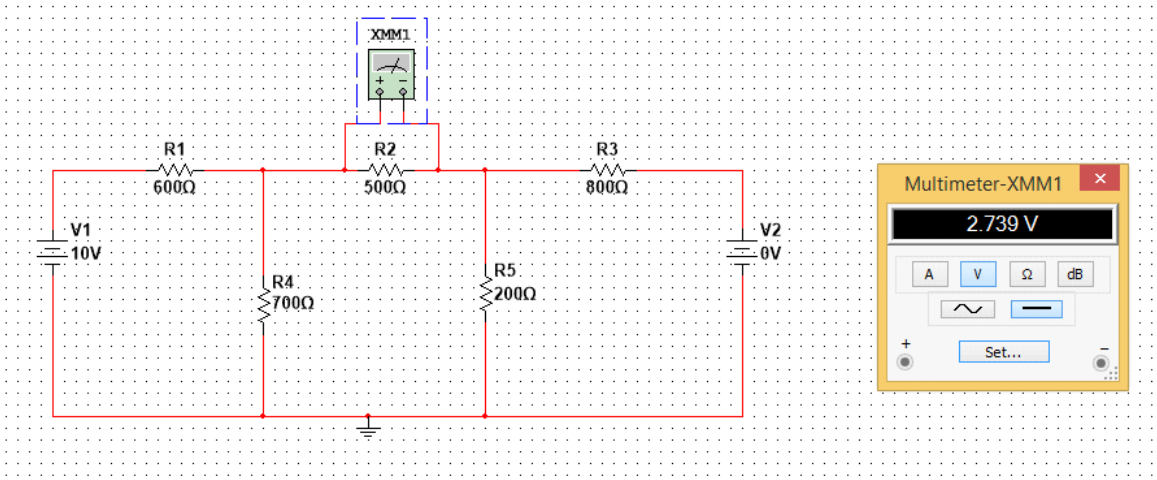
Problem:

Find the voltage across 500 ohm resistor in the given circuit using SPT.



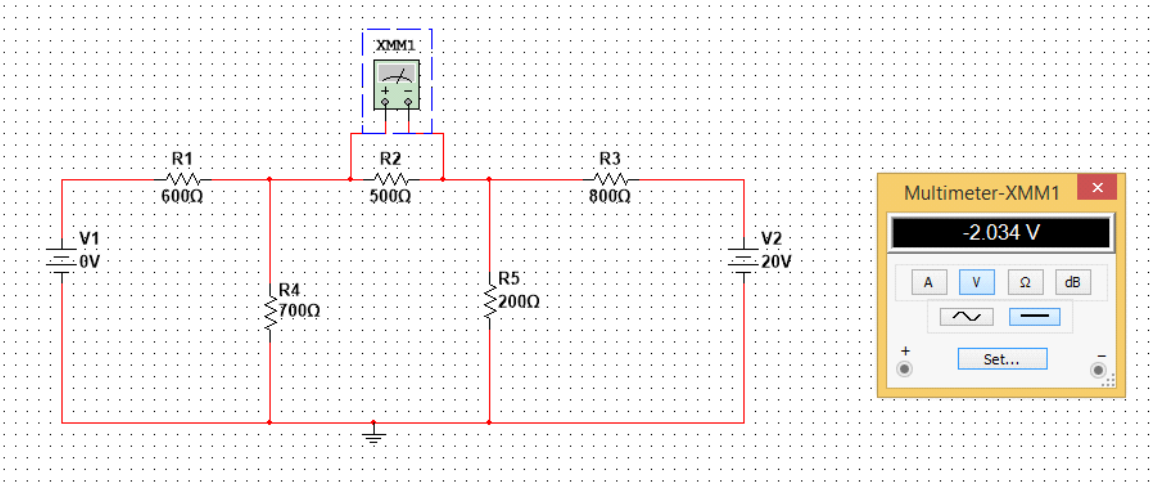
Solution:

Consider 10V source



V_{R1} = 2.739 V

Consider 20V source



V_{R2} = -2.034 V

By SPT we have,

$V_{R1} + V_{R2} = V_R$

2.739 +(-2.034) = 0.7 V

V_R = 0.7 V

The value that is obtained is same as the one that was found in circuit 1.

Thevenin's Theorem

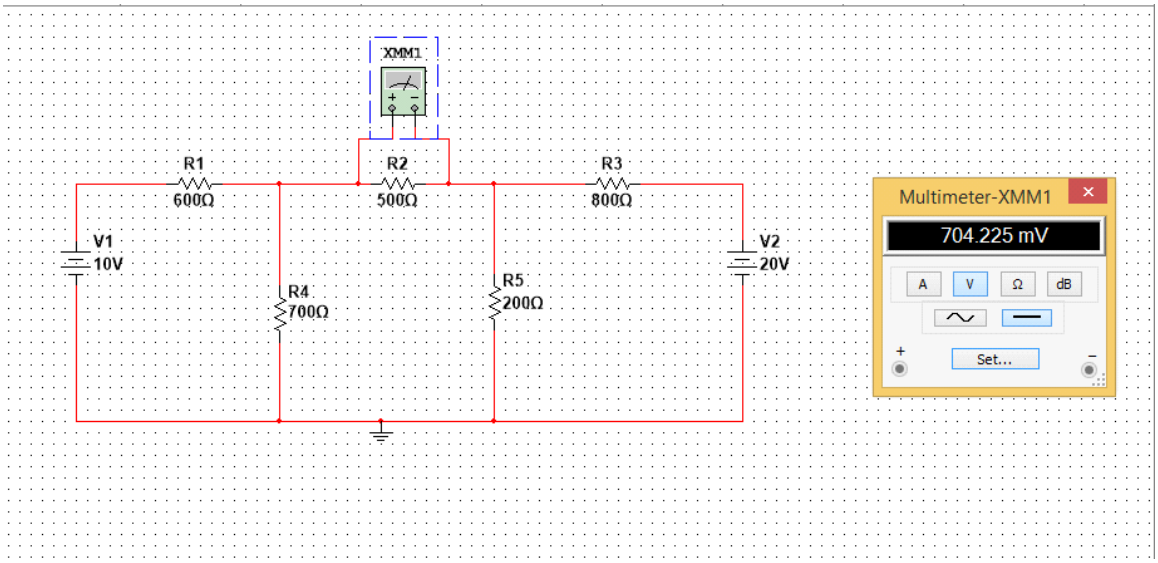
It states that any two terminal linear network containing energy sources and impedences can be replaced with an equivalent circuit consisting of voltage source Vth in series with an impedance Zph.

Vth is the open circuit voltage between terminals of the network

Zph is the impedance measured between terminals of the network with all energy sources eliminated (but not their impedances).

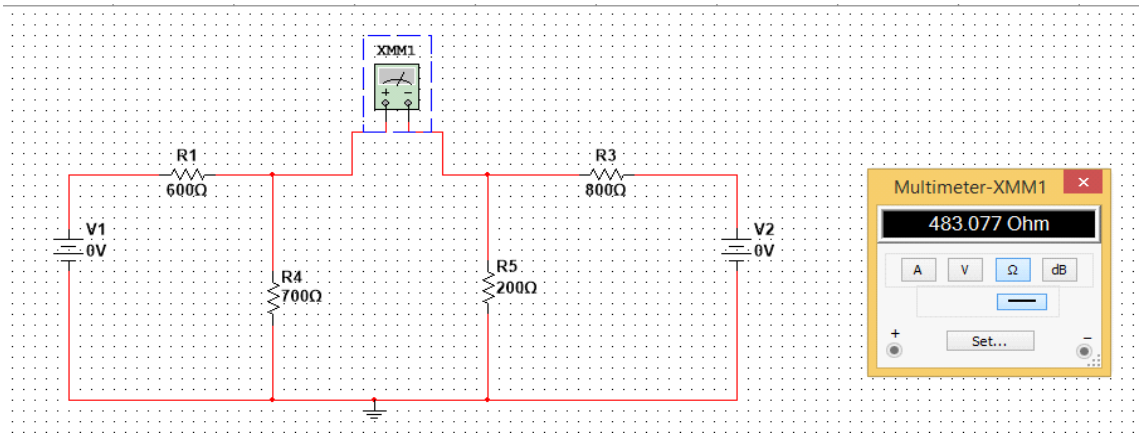
Problem:

Find the voltage across 500 ohm resistor using thevenin's theorem



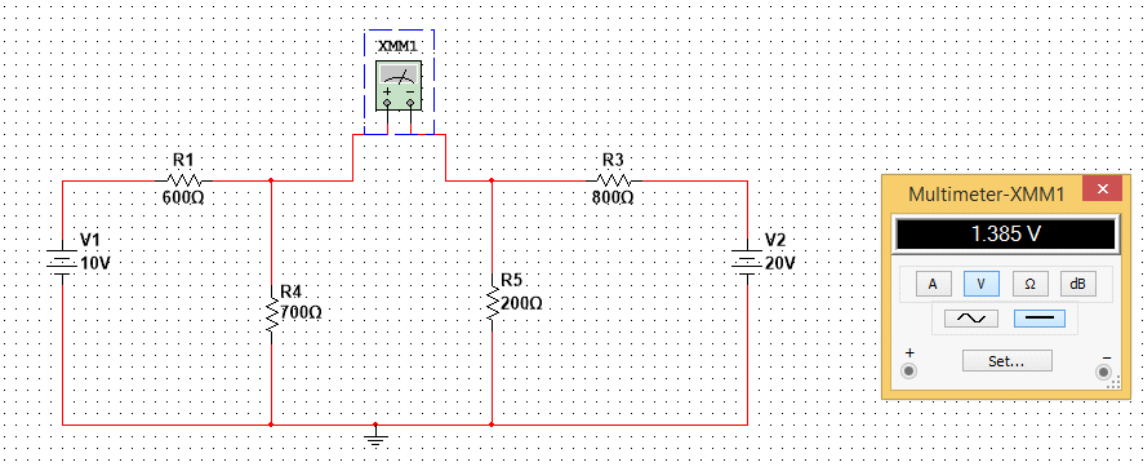
Solution:

To find R_{th}



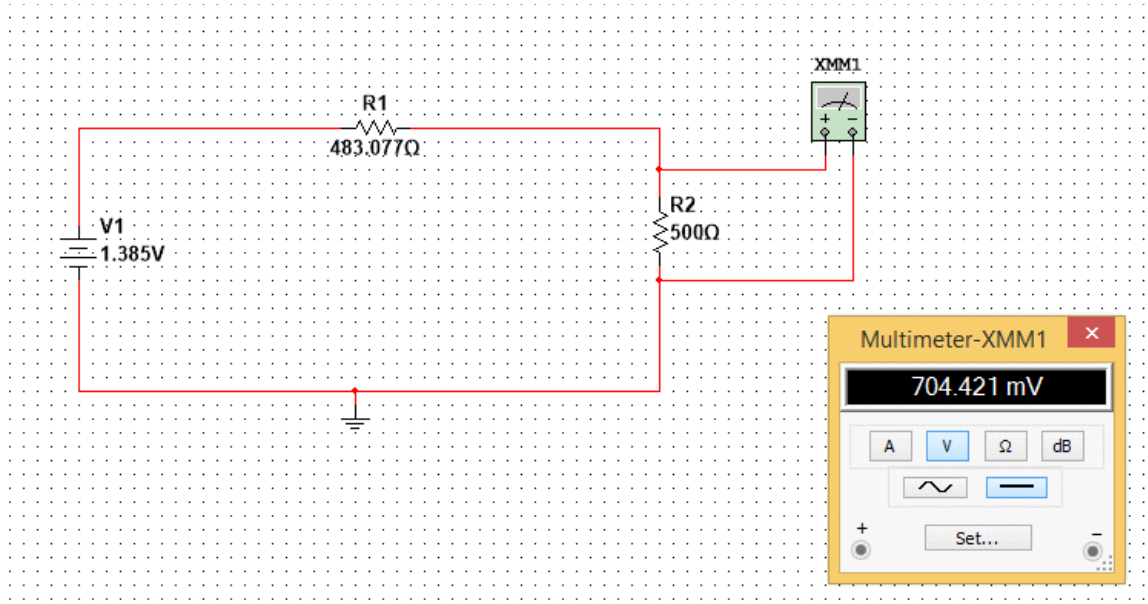
R_{th} = 483.077 ohm

To find V_{oc}



V_{oc} = 1.385 V

Thevenin's equivalent:



The voltage across 500 ohm is **0.7 V** by thevenin's theorem as obtained in circuit 1.

Norton's theorem

It states that a linear two terminal network can be replaced by an equivalent circuit consisting of a current source In in parallel with resistor Rn.

In is short circuit current to the terminals

Rn is the equivalent resistance when the independent sources are deactivated

Norton's theorem is the reciprocal of Thevenin's theorem.

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Acknowledgement :

It was a good experiment to perform. Thank you sir.