

Name _____

EE 2240

Exam #1

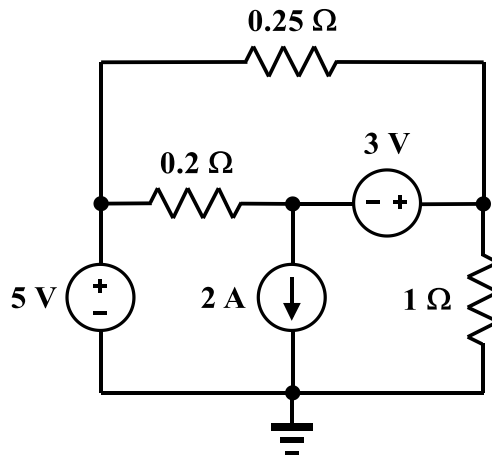
Thursday, September 21, 2017

LIBR B32 and TAB 115, 9:30AM – 10:45AM

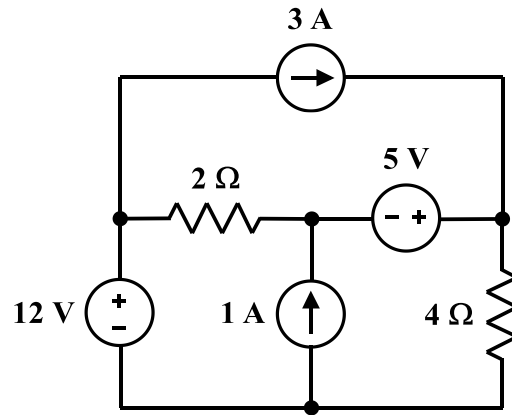
[closed book – one two-sided 8½”×11” page of notes and calculator allowed, nothing else]

**Work must be shown in a neat and orderly fashion if you expect to receive partial credit.
Clearly define any and all new variables you use in your solutions.**

1. Use the nodal analysis method to formulate a system of simultaneous linear equations representing the circuit shown below. Express the equations in the standard matrix form discussed in class.



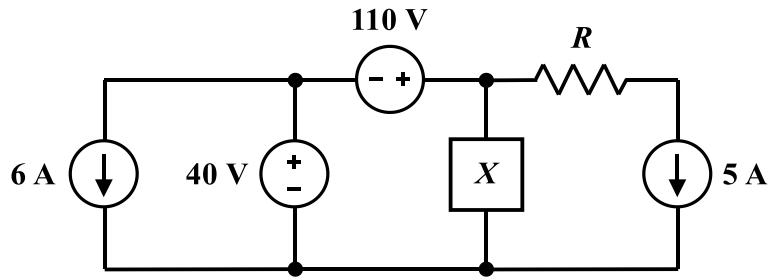
2. Use the mesh analysis method to formulate a system of simultaneous linear equations representing the circuit shown below. Express the equations in the standard matrix form discussed in class.



3. Use any method to solve for x_2 in the set of equations shown below.

$$\begin{bmatrix} 7 & -3 & -4 \\ -3 & 6 & -2 \\ -4 & -2 & 11 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} -11 \\ 3 \\ 25 \end{bmatrix}$$

4. In the circuit shown below, the 5A current source is delivering 100W, and the 40V source is delivering 500W.



- a. Determine the value of resistor R .
- b. Is component X *absorbing* power or *delivering* power? How much?