X

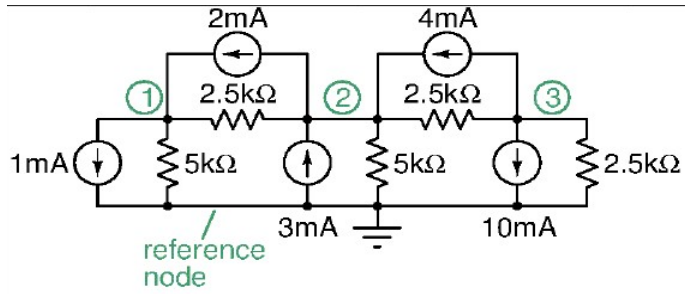
Unit 6 - Week 4: Nodal analysis

Assignment 4

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-10-14, 23:59 IST.

1)



Assume source vector to be:

$$\begin{bmatrix} 1 & \text{mA} \\ 5 & \text{mA} \\ -14 & \text{mA} \end{bmatrix}$$

Setup the nodal analysis equations for the circuit above. Enter the G matrix in the space provided below.

A matrix of the form :

$$\begin{matrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{matrix}$$

can be entered as: -1 0 0;0 1 0;0 0 -1

- Do not have any space before the first element of the row.
- Put a semicolon after the last element of row1 & row2. Do not put any semicolon after last element of 3rd row.
  => row1;row2;row3
- Do not put a space before or after semicolon.
- Do not have any trailing zeros, i.e., do not write 5.5 as 5.50 or 5 as 5.0
- Follow the rounding off instruction strictly.
- Follow all the instructions strictly otherwise you will loose your marks.

(The [G] matrix entries should be in **millisiemens (mS)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 0.6 -0.4 0;-0.4 1 -0.4;0 -0.4 0.8

1 point

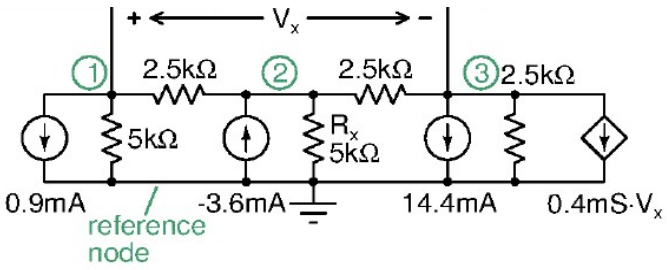
2) Determine the voltage at node 3 in the circuit above.

(The answer must be in **volts (V)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) -19,-18.5

1 point

3)



Assume source vector to be:

-0.9 mA
-3.6 mA
-14.4 mA

Setup the nodal analysis equations for the circuit above. Enter the G matrix in the space provided below.

A matrix of the form :

$$\begin{matrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{matrix}$$

can be entered as: -1 0 0;0 1 0;0 0 -1

- Do not have any space before the first element of the row.
- Put a semicolon after the last element of row1 & row2. Do not put any semicolon after last element of 3rd row.
  => row1;row2;row3
- Do not put a space before or after semicolon.
- Do not have any trailing zeros, i.e., do not write 5.5 as 5.50 or 5 as 5.0
- Follow the rounding off instruction strictly.
- Follow all the instructions strictly otherwise you will loose your marks.

(The $[G]$ matrix entries should be in **millisiemens (mS)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 0.6 -0.4 0;-0.4 1 -0.4;0.4 -0.4 0.4

1 point

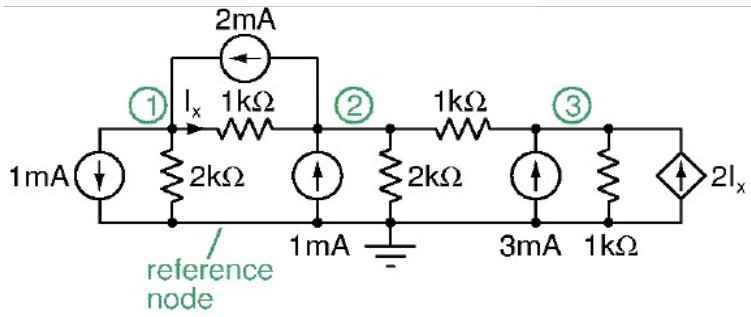
4) Determine the power dissipated in the resistor R_x in the circuit above.

(The answer must be in **milliwatts (mW)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 179,181

1 point

5)



Assume source vector to be:

$$\begin{bmatrix} 1\text{ mA} \\ -1\text{ mA} \\ 3\text{ mA} \end{bmatrix}$$

Setup the nodal analysis equations for the circuit above. Enter the G matrix in the space provided below.

A matrix of the form :
$$\begin{matrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{matrix}$$

can be entered as: -1 0 0;0 1 0;0 0 -1

- Do not have any space before the first element of the row.
- Put a semicolon after the last element of row1 & row2. Do not put any semicolon after last element of 3rd row.
  => row1;row2;row3
- Do not put a space before or after semicolon.
- Do not have any trailing zeros, i.e., do not write 5.5 as 5.50 or 5 as 5.0
- Follow the rounding off instruction strictly.
- Follow all the instructions strictly otherwise you will loose your marks.

(The $[G]$ matrix entries should be in **millisiemens (mS)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 1.5 -1 0;-1 2.5 -1;-2 1 2

1 point

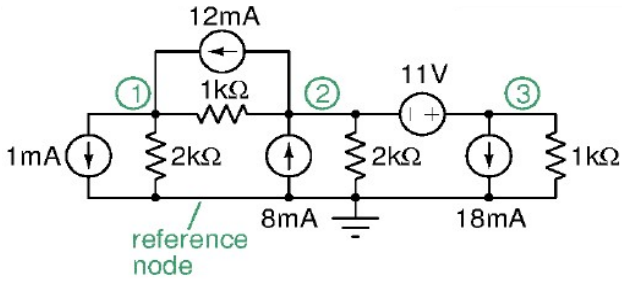
6) Determine the voltage at node 3 in the circuit above.

(The answer must be in **volts (V)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 2.1,2.5

1 point

7)



Assume source vector to be:

$$\begin{bmatrix} 11\text{ mA} \\ -22\text{ mA} \\ 11\text{ V} \end{bmatrix}$$

Setup the nodal analysis equations for the circuit above. Enter the G matrix in the space provided below.

Have the equations in the following order: node equation, supernode equation, voltage source equation.

A matrix of the form :

$$\begin{matrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{matrix}$$

can be entered as: -1 0 0;0 1 0;0 0 -1

- Do not have any space before the first element of the row.
- Put a semicolon after the last element of row1 & row2. Do not put any semicolon after last element of 3rd row. => row1;row2;row3
- Do not put a space before or after semicolon.
- Do not have any trailing zeros, i.e., do not write 5.5 as 5.50 or 5 as 5.0
- Follow the rounding off instruction strictly.
- Follow all the instructions strictly otherwise you will loose your marks.

(The $[G]$ matrix entries should be in **millisiemens (mS)** if they are conductances or scalars as applicable. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 1.5 -1 0;-1 1.5 1;0 -1 1

1 point

8) Determine the voltage at node 2 in the circuit above. (You have already setup the nodal analysis equation for this circuit in the previous question. But, the $[G]$ matrix has conductances and dimensionless numbers. Be careful while inverting the matrix!).

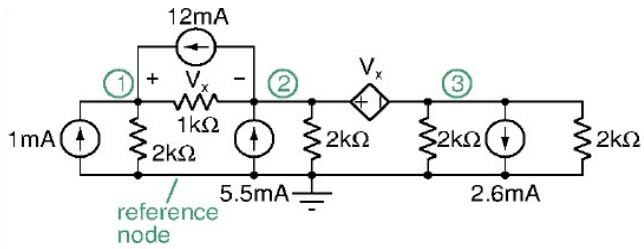
(The answer must be in **volts (V)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) -14.25,-13.75

1 point

9)



Assume source vector to be:

[13 mA
-9.1 mA
0]

Setup the nodal analysis equations for the circuit above. Enter the G matrix in the space provided below.

Have the equations in the following order: node equation, supernode equation, voltage source equation.

A matrix of the form :

$$\begin{matrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{matrix}$$

can be entered as: -1 0 0;0 1 0;0 0 -1

- Do not have any space before the first element of the row.
- Put a semicolon after the last element of row1 & row2. Do not put any semicolon after last element of 3rd row.
  => row1;row2;row3
- Do not put a space before or after semicolon.
- Do not have any trailing zeros, i.e., do not write 5.5 as 5.50 or 5 as 5.0
- Follow the rounding off instruction strictly.
- Follow all the instructions strictly otherwise you will loose your marks.

(The $[G]$ matrix entries should be in **millisiemens (mS)** if they are conductances or scalars as applicable. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 1.5 -1 0;-1 1.5 1;1 -2 1
(Type: String) 1.5 -1 0;-1 1.5 1;-1 2 -1

1 point

10) Determine the voltage at node 1 in the circuit above. (You have already setup the nodal analysis equation for this circuit in the previous question. But, the $[G]$ matrix has conductances and dimensionless numbers. Be careful while inverting the matrix!).

(The answer must be in **volts (V)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 11,11.4

1 point