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NPTTEL

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Courses » Basic Electrical Circuits Announcements Course Ask a Question Progress Mentor FAQ

Unit 9 - Week 7: Two port parameters continued; Reciprocity in resistive networks

Course outline

How to access the portal

Pre-requisite Assignment

Week 1: Preliminaries; Current and voltage; Electrical elements and circuits; Kirchhoff's laws; Basic elements; Linearity

Week 2: Elements in series and parallel; Controlled sources

Week 3: Power and energy in electrical elements; Circuit analysis methods

Week 4: Nodal analysis

Week 5 : Mesh analysis; Circuit theorems

Week 6: More circuit theorems; Two port parameters

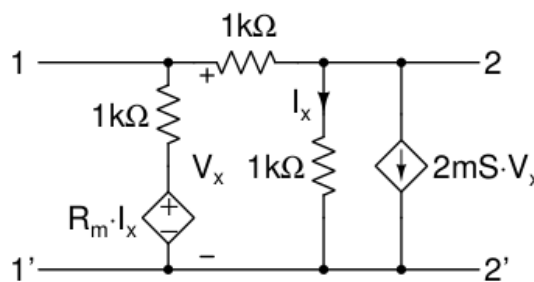
Week 7: Two port parameters continued:

Assignment 7

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

Due on 2018-09-19, 23:59 IST.

1)



The two-port network in the figure above is reciprocal. Determine R_m .

(The answer must be in kilohms (kΩ). Round off fractional answers to one decimal place.)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Numeric) -2

1 point

2)

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- h parameters
- h parameters: Examples
- g parameters
- g parameters: Examples
- Calculations with a two-port element
- Calculations with a two-port element
- Degenerate cases
- Relationships between different two-port parameters
- Equivalent circuit representation for two ports
- Reciprocity
- Proof of reciprocity of resistive two-ports
- Proof for 4-terminal two-ports
- Reciprocity in terms of different two-port parameters
- Reciprocity in circuits containing controlled sources
- Examples
- Quiz : Assignment 7
- Week 7 Feedback : Basic Electrical Circuits

Week 8: Opamp and negative feedback; Example circuits and additional topics

Week 9 :First Order Circuits

Week 10 : First order circuits with time-varying inputs

Week 11: Second order system response

Week 12: Direct

Devel

With R_m chosen such that the two-port network in the figure above is reciprocal, determine the h -parameters of the circuit above.

Enter the h -parameter matrix in the space provided below, one row on each line. e.g. if the h -parameter matrix is as shown below,

$$[h] = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

you should enter

1 2

3 4

In the matrix entry,

Do not have any space at the start of the line

Have exactly one space between entries on each row

Do not have any space after the last entry in each row

Do not have any trailing zeros, i.e., do not write 5.5 as 5.50 or 5 as 5.0

(The h -parameter matrix entries should be in **millisiemens (mS)** or kilohms or scalar values as applicable. Round off fractional answers to one decimal place.)

No, the answer is incorrect.

Score: 0

Accepted Answers:

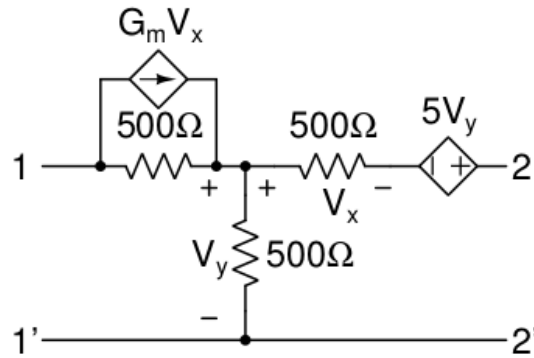
(Type: String) 0.5 -0.5 0.5 1.5

3)

1 point

calculation of
steady state
response from
equivalent
components

Video Download



The two-port network in the figure above is reciprocal. Determine G_m .

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

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Numeric) 10

1 point

4)

With G_m chosen as above, determine the g -parameters of the circuit above.

Enter the g -parameter matrix in the space provided below, one row on each line. e.g. if the g -parameter matrix is as shown below,

$$[g] = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

you should enter

1 2

3 4

In the matrix entry,

Do not have any space at the start of the line

Have exactly one space between entries on each row

Do not have any space after the last entry in each row

Do not have any trailing zeros, i.e., do not write 5.5 as 5.50 or 5 as 5.0

(The g -parameter matrix entries should be in **millisiemens (mS)** or kilohms or scalar values as applicable. Round off fractional answers to one decimal place.)

No, the answer is incorrect.

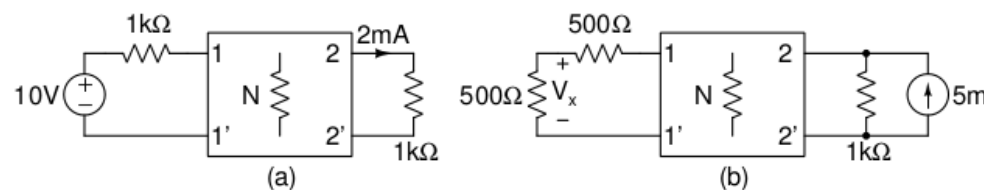
Score: 0

Accepted Answers:

(Type: String) 1 -3 3 -5.5

1 point

5)



The network N in the figure above consists of only resistors. Given (a), determine V_x in (b).

(The answer must be in volts (V). Round off fractional answers to two decimal places.)

No, the answer is incorrect.

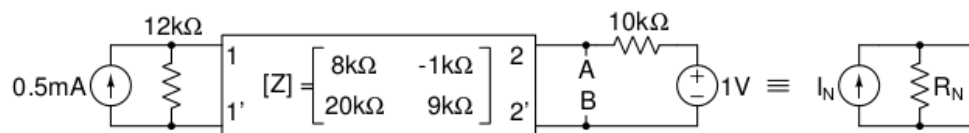
Score: 0

Accepted Answers:

(Type: Numeric) 0.5

1 point

6)



Determine the Norton current I_N in the circuit above.

(The answer must be in milliamperes (mA). Round off fractional answers to one decimal place.)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Numeric) 0.7

1 point

7)

Determine the Norton resistance R_N in the circuit above.

(The answer must be in kilohms (kΩ). Round off fractional answers to one decimal place.)

No, the answer is incorrect.

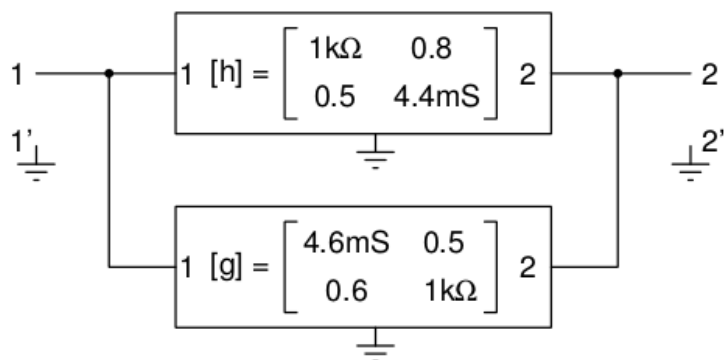
Score: 0

Accepted Answers:

(Type: Numeric) 5

1 point

8)



In the above circuit, two two-port networks are combined to form a single two-port network. Determine the y -parameters of the composite two-port.

Enter the y -parameter matrix in the space provided below, one row on each line. e.g. if the y -parameter matrix is as shown below,

$$[Y] = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

you should enter

1 2

3 4

In the matrix entry,

Do not have any space at the start of the line

Have exactly one space between entries on each row

Do not have any space after the last entry in each row

Do not have any trailing zeros, i.e., do not write 5.5 as 5.50 or 5 as 5.0

(The y -parameter 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) 5.3 -0.3 -0.1 5

1 point

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End

