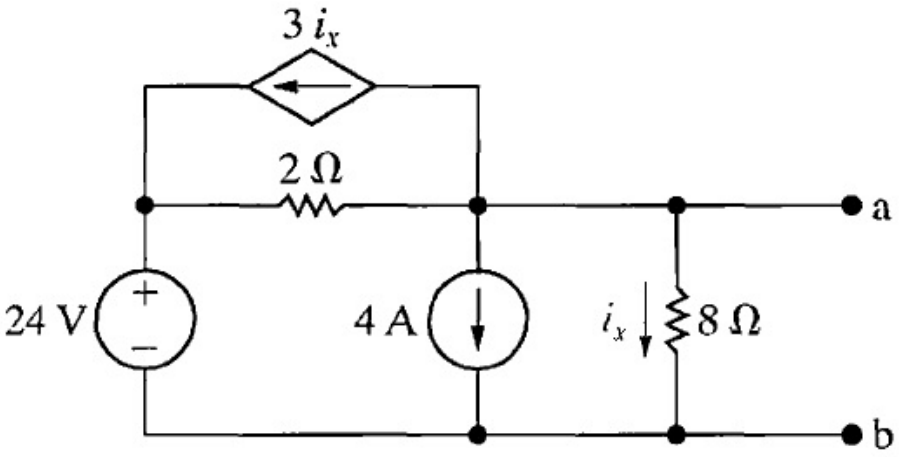
Started on	Wednesday, 26 October 2016, 12:13 PM
State	Finished
Completed on	Sunday, 30 October 2016, 4:32 PM
Time taken	4 days 4 hours
Grade	**94.50** out of 100.00

Question 1

Correct

Mark 10.00 out of 10.00



AP4.19_9ed

Find the Thévenin equivalent circuit with respect to the terminals a,b for the circuit shown

V_{Th} = 8 ✓ V

R_{Th} = 1 ✓ Ω (Ohm)

Numeric Answer

V_{Th} = 8 V
R_{Th} = 1 Ω

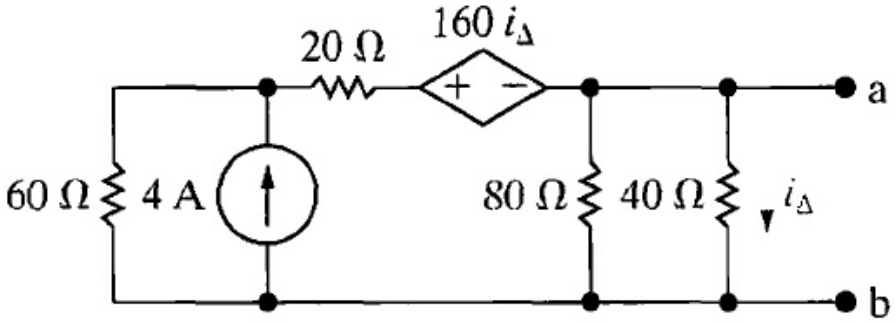
Correct

Marks for this submission: 10.00/10.00.

Question 2

Correct

Mark 10.00 out of 10.00



AP4.20_9ed

Find the Thévenin equivalent circuit with respect to the terminals a,b for the circuit shown.

Hint: Define the voltage at the left-most node as *v*, and write two nodal equations with V_{Th} as the right node voltage.

V_{Th} = 30 ✓ V

R_{Th} = 10 ✓ Ω (Ohm)

Numeric Answer

V_{Th} = 30 V
R_{Th} = 10 Ω

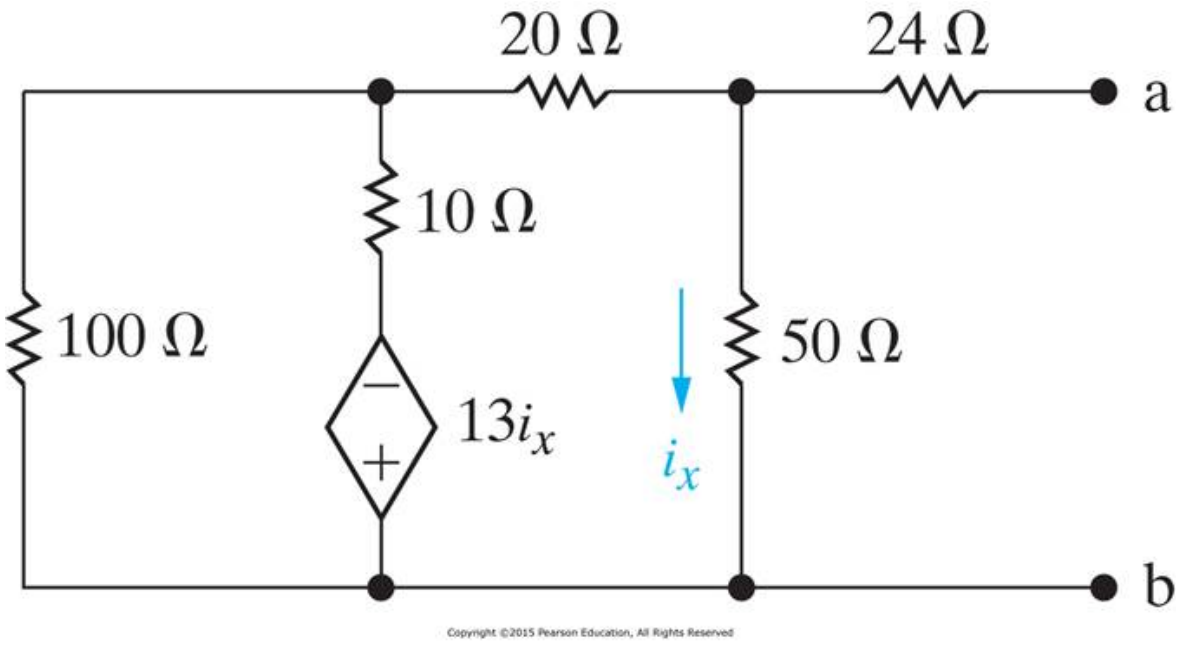
Correct

Marks for this submission: 10.00/10.00.

Question 3

Correct

Mark 10.00 out of 10.00



P4.80_10ed

Find the Thévenin equivalent circuit with respect to the terminals a,b for the circuit shown.

Hint: Note that there are no independent sources in this circuit! You will have to provide an excitation to get a response.

V_{Th} = 0 ✓ V

R_{Th} = 40 ✓ Ω (Ohm)

Numeric Answer

V_{Th} = 0 V
R_{Th} = 40 Ω

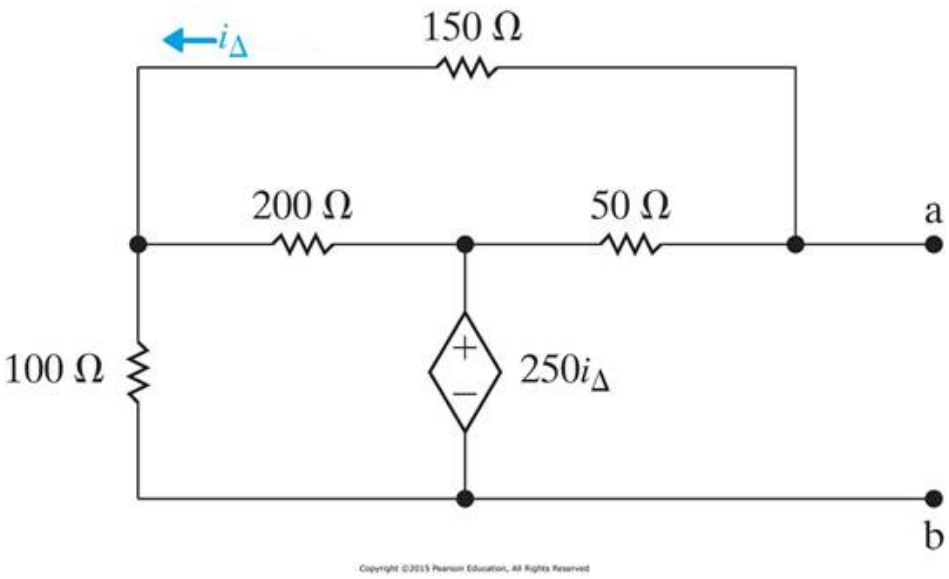
Correct

Marks for this submission: 10.00/10.00.

Question 4

Partially correct

Mark 5.00 out of 10.00



P4.79_10ed

Find the Thévenin equivalent circuit with respect to the terminals a,b for the circuit shown.

Hint: Note that there are no independent sources in this circuit! You will have to provide an excitation to get a response.

V_{Th} = 0 ✓ V

R_{Th} = 0 ✗ Ω (Ohm)

Numeric Answer

V_{Th} = 0 V
R_{Th} = 150.0 Ω

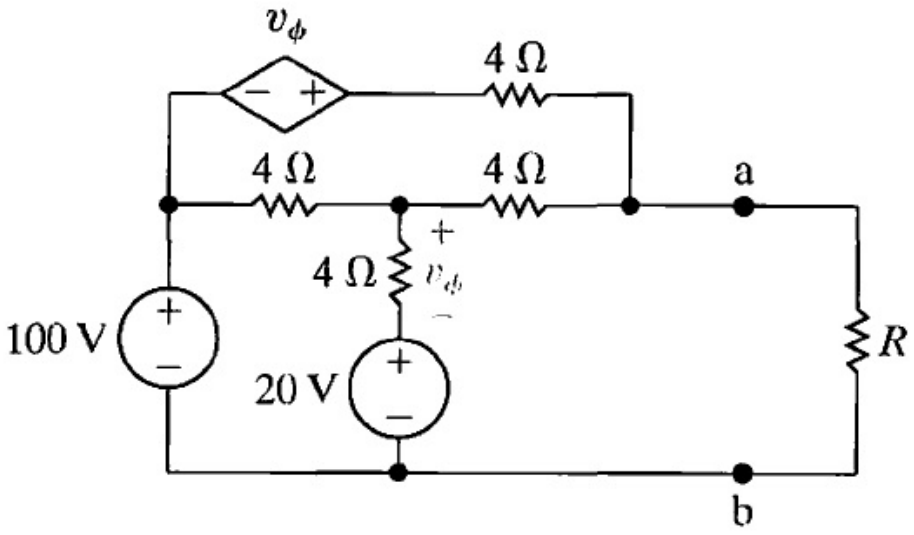
Partially correct

Marks for this submission: 5.00/10.00.

Question 5

Correct

Mark 10.00 out of 10.00



AP4.21_9ed

a) Find the value of R that enable the circuit to deliver maximum power to the terminals a,b

R = 3 ✓ Ω (Ohm)

b) Find the maximum power delivered to R

P_R = 1200 ✓ W

Numeric Answer

R = 3 Ω

P_R = 1,200 W

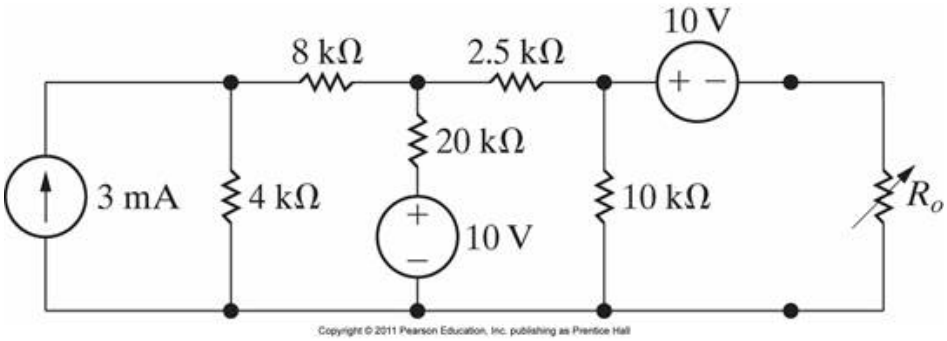
Correct

Marks for this submission: 10.00/10.00.

Question 6

Correct

Mark 9.50 out of 10.00



P4.79_9ed

The variable resistor in the circuit is adjusted for maximum power transfer to R_0.

a) Find the value of R_0.

R_0 = {4.90|5.10 5 ✓ kΩ (kilo Ohm)

b) Find the maximum power that can be delivered to R_0.

P_{max} = 957 ✓ μW (micro W)

Numeric Answer

R = 5kW (kilo Ohm)

$P_{Ro,max}$ = 957.03 μW (microwatt)

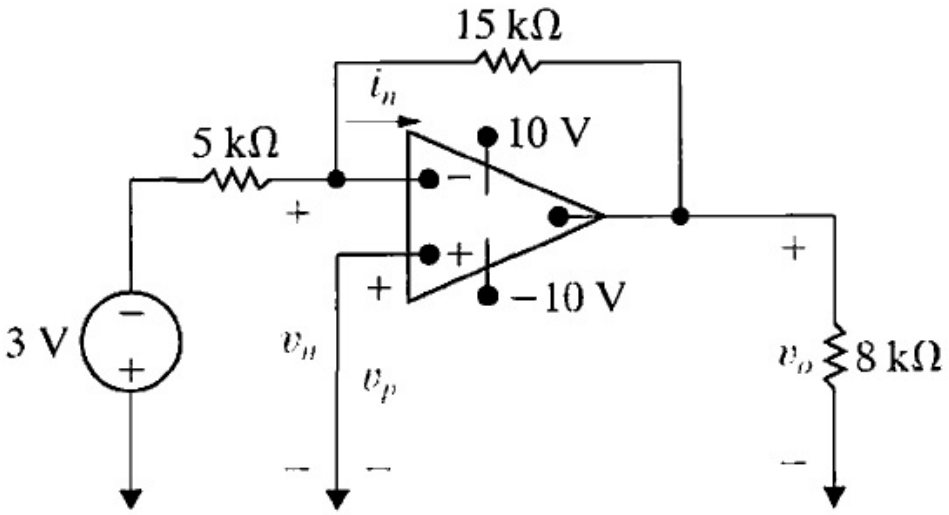
Correct

Marks for this submission: 10.00/10.00. Accounting for previous tries, this gives **9.50/10.00**.

Question 7

Correct

Mark 10.00 out of 10.00



P5.01_9ed

Assume the op amp is ideal.

a) What is the value of the current i_n? i_n = 0 ✓ A

b) What is the value of v_n? v_n = 0 ✓ V

c) Calculate v_0 in this circuit. v_0 = 9 ✓ V

Numeric Answer

a) $i_n = 0$ (zero)

b) $v_n = 0$ (zero) Volts

c) $v_0 = 9V$

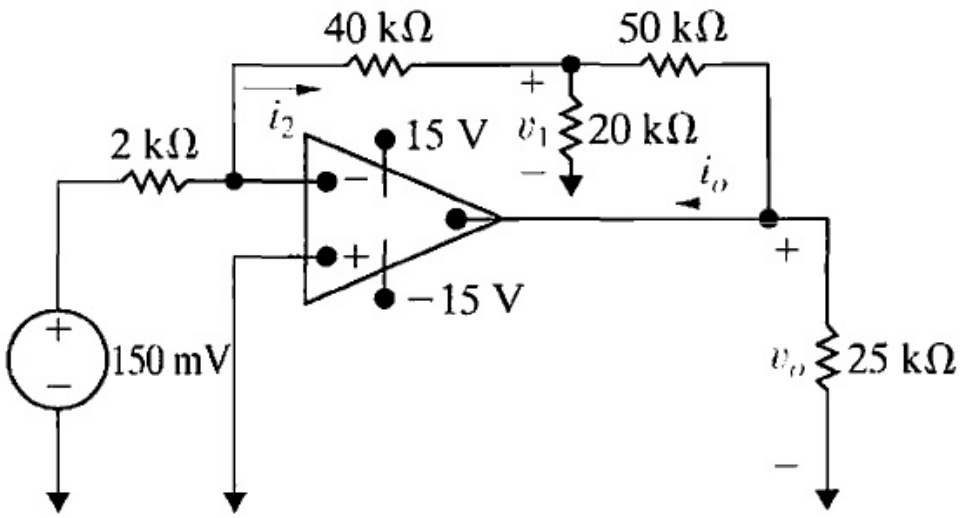
Correct

Marks for this submission: 10.00/10.00.

Question 8

Correct

Mark 10.00 out of 10.00



P5.06_9ed

Assume the op amp is ideal.

Calculate v_1, v_0, i_2, and i_0.

v_1 = -3 ✓ V

v_O = -14.25 ✓ V

i_2 = 75 ✓ µA (micro Amp)

i_O = 795 ✓ µA (micro Amp)

Numeric Answer

v_1 = -3 V v_O = -14.25 V

i_2 = 75 µA i_O = 795 µA

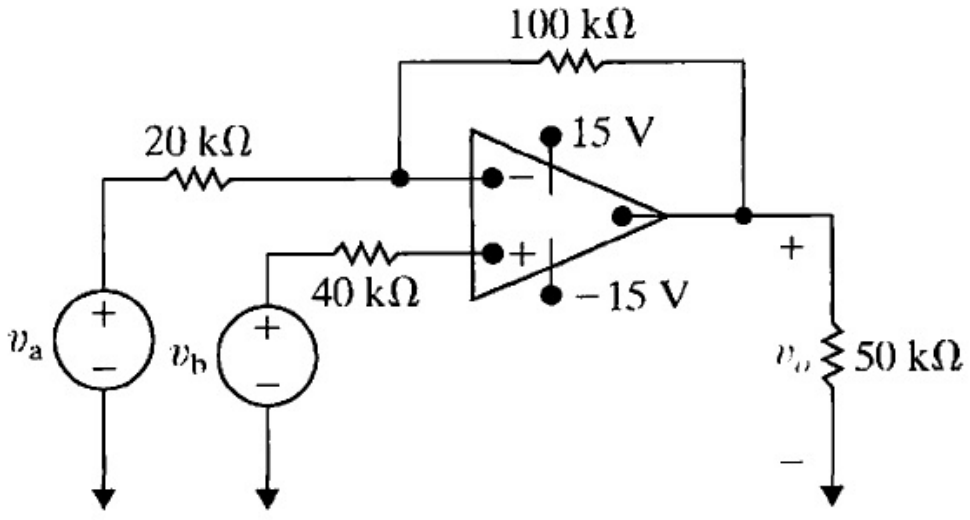
Correct

Marks for this submission: 10.00/10.00.

Question 9

Correct

Mark 10.00 out of 10.00



P5.03_9ed

Assume the op amp is ideal.

a) Calculate v_O if $v_a = 4$ V and $v_b = 0$ V. $v_O =$ -15 ✓ V

b) Calculate v_O if $v_a = 2$ V and $v_b = 0$ V. $v_O =$ -10 ✓ V

c) Calculate v_O if $v_a = 2$ V and $v_b = 1$ V. $v_O =$ -4 ✓ V

d) Calculate v_O if $v_a = 1$ V and $v_b = 2$ V. $v_O =$ 7 ✓ V

e) Calculate v_O if $v_a = 1.5$ V and $v_b = 4$ V. $v_O =$ 15 ✓ V

f) If $v_b = 1.6$ V, specify the range of v_a such that the amplifier does not saturate.

-1.08 ✓ $\leq v_a \leq$ 4.92 ✓ V

Numeric Answer

a) If $v_a = 4$ V and $v_b = 0$ V then $v_O = -15.0$ V op amp in saturation

b) If $v_a = 2$ V and $v_b = 0$ V then $v_O = -10.0$ V

c) If $v_a = 2$ V and $v_b = 1$ V then $v_O = -4$ V

d) If $v_a = 1$ V and $v_b = 2$ V then $v_O = 7$ V

e) If $v_a = 1.5$ V and $v_b = 4$ V then $v_O = 15$ V op amp in saturation

f) Specify the range of v_S required to avoid amplifier saturation.

$-1.08 \leq v_a \leq 4.92$ V

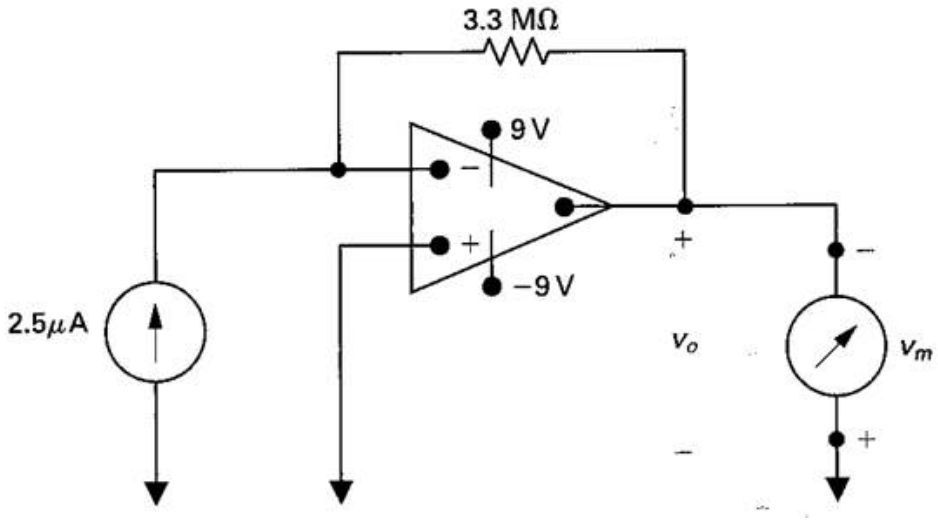
Correct

Marks for this submission: 10.00/10.00.

Question 10

Correct

Mark 10.00 out of 10.00



P5.01_6ed

Assume the op amp is ideal.

A voltmeter capable of a full-scale reading of 10 V is used to measure the output voltage of this circuit.

What is the reading of the voltmeter?

V_m = 8.25 ✓ V

Numeric Answer

V_m = 8.25 V

Correct

Marks for this submission: 10.00/10.00.