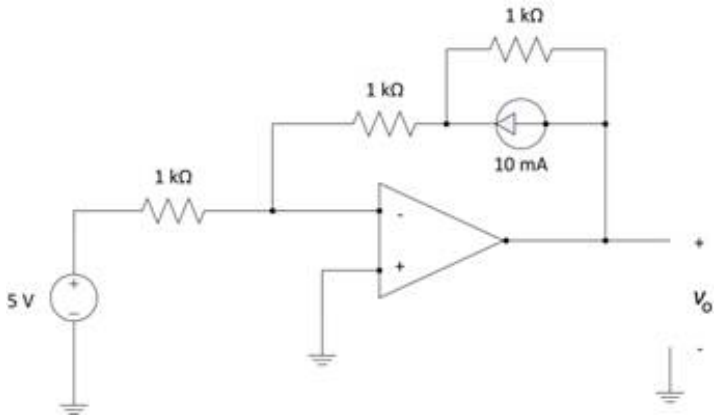
Started on	Thursday, 27 October 2016, 12:48 PM
State	Finished
Completed on	Thursday, 27 October 2016, 12:49 PM
Time taken	13 secs
Grade	**88.0** out of 100.0

Question 1

Not answered

Mark 0.0 out of 5.0



AS5.1

Find v_0.

v_0 = ✗ V

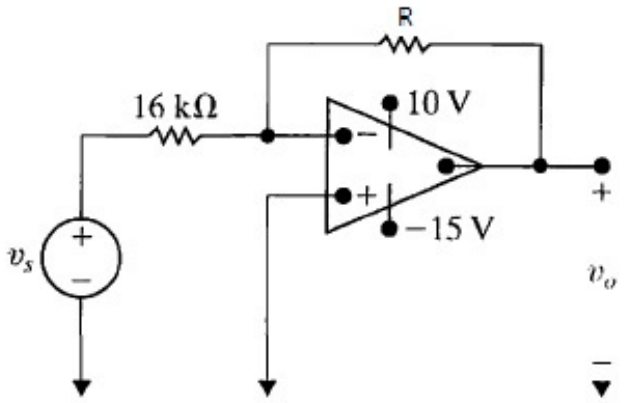
Numeric Answer

v_0 = -20 V

Question 2

Correct

Mark 5.0 out of 5.0



AP5.02_9ed

The source voltage v_S in this circuit is -640 mV.

What range of R allows the inverting amplifier to operate in its linear region?

0 ✓ kΩ < R < 250 ✓ kΩ (kilo Ohms)

Numeric Answer

$0\ \Omega \leq R \leq 250\ \text{k}\Omega$

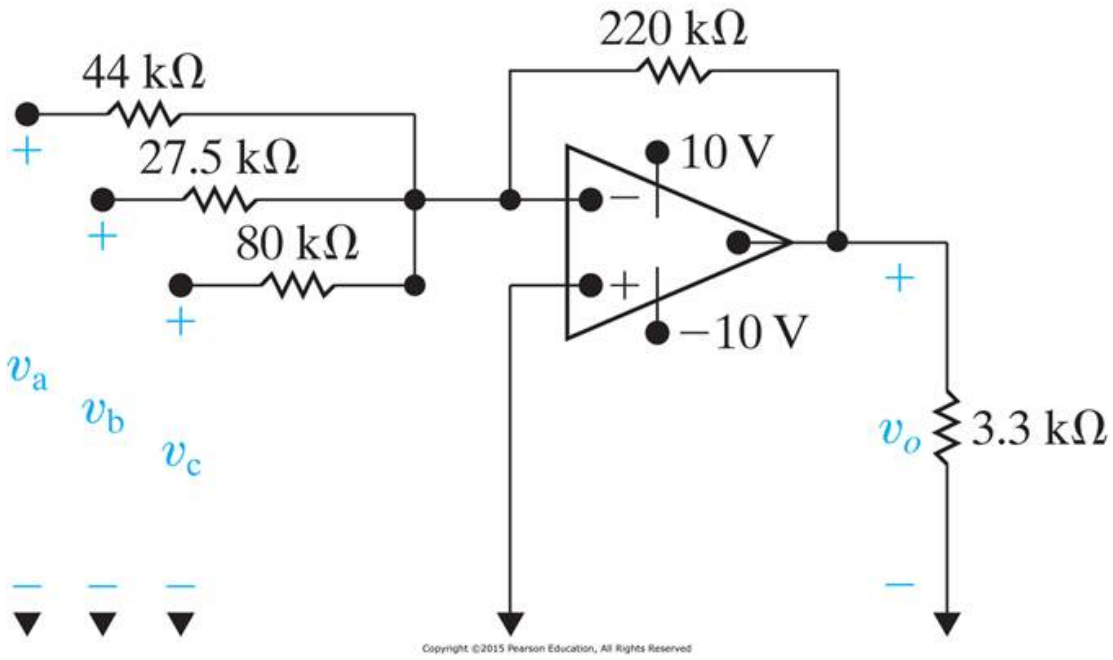
Correct

Marks for this submission: 5.0/5.0.

Question 3

Correct

Mark 5.0 out of 5.0



P5.12_10ed

Assume the op amp is ideal.

Find v_o if v_a = 1 V, v_b = 1.5 V, v_c = -4 V.

v_o = -6 ✓ V

Numeric Answer

v_o = -6 V

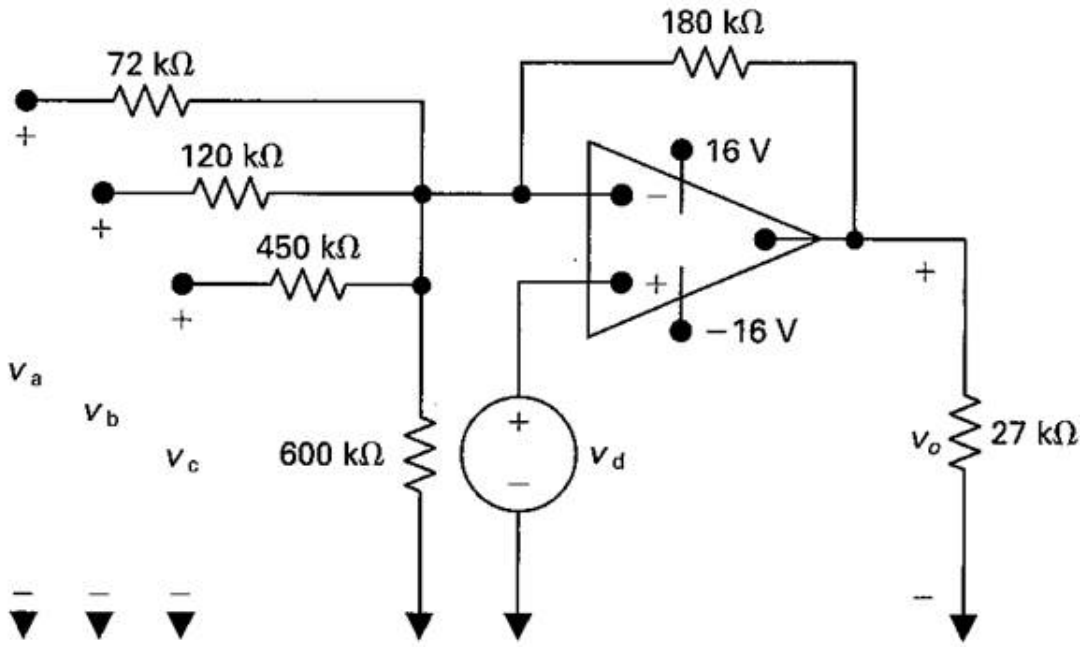
Correct

Marks for this submission: 5.0/5.0.

Question 4

Correct

Mark 5.0 out of 5.0



P5.10_6ed

Assume the op amp is ideal.
Given:

$V_a = 18V \quad V_b = 6V \quad V_c = -15V \quad V_d = 8V$

Find V_0.

$V_0 =$ -2.4 ✓ V

Numeric Answer

$V_0 = -2.4$ V

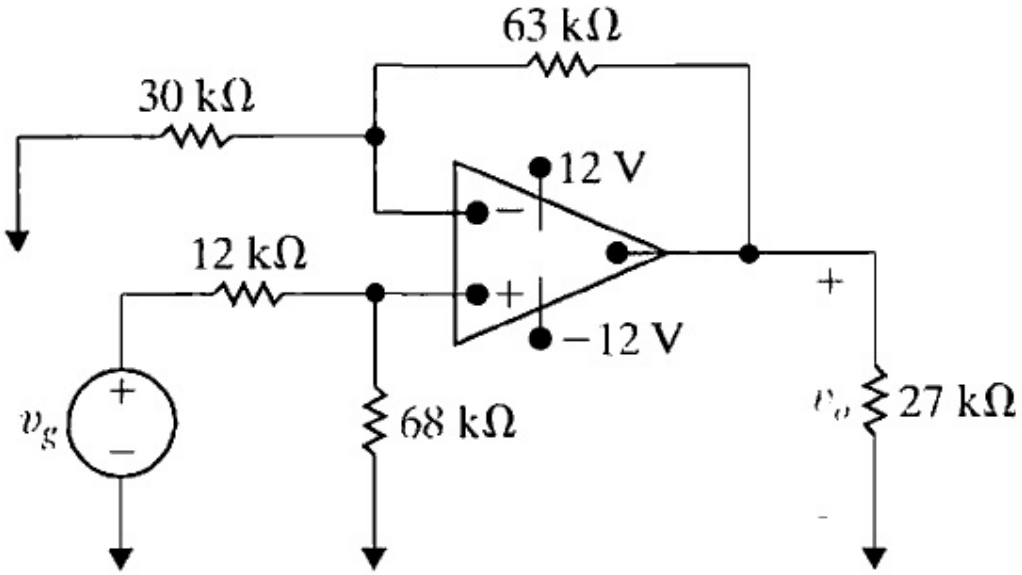
Correct

Marks for this submission: 5.0/5.0.

Question 5

Correct

Mark 5.0 out of 5.0



P5.18_9ed

Specify the range of values of v_g so that the op amp operates in a linear mode

-4.55 ✓ $\leq v_g \leq$ 4.55 ✓ V

Numeric Answer

$-4.554 \leq v_g \leq 4.554$ V

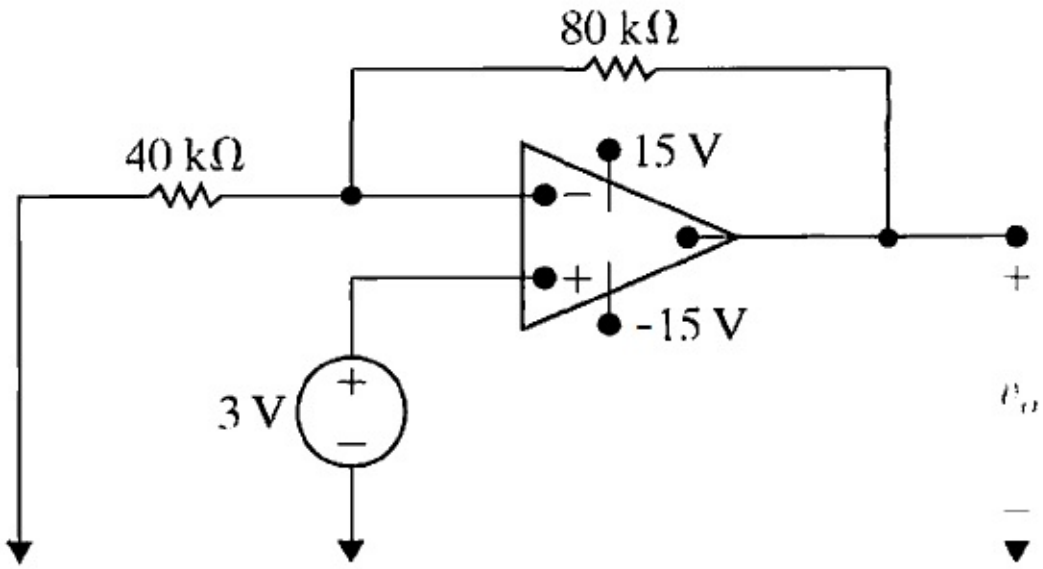
Correct

Marks for this submission: 5.0/5.0.

Question 6

Correct

Mark 5.0 out of 5.0



P5.16_9ed

Calculate v_0 for this circuit.

v_0 = 9 ✓ V

Numeric Answer

v_0= 9 V

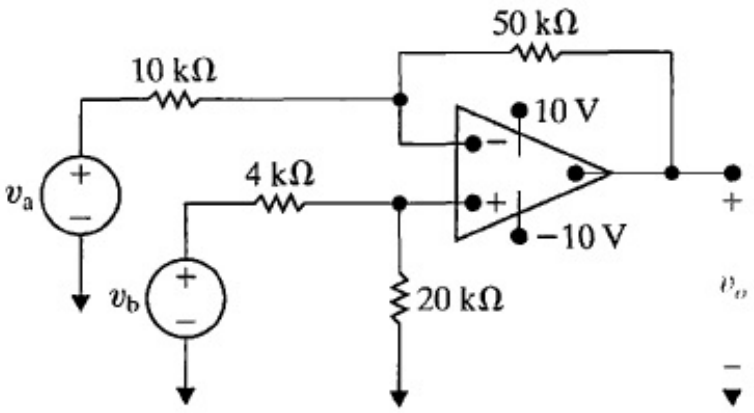
Correct

Marks for this submission: 5.0/5.0.

Question 7

Correct

Mark 5.0 out of 5.0



AP5.05_9ed

In the difference amplifier shown, $v_b = 4.0$ V.

What range of values for v_a will result in linear operation?

2 ✓ $\leq v_a \leq$ 6 ✓ V

Numeric Answer

$2 \text{ V} \leq v_a \leq 6 \text{ V}$

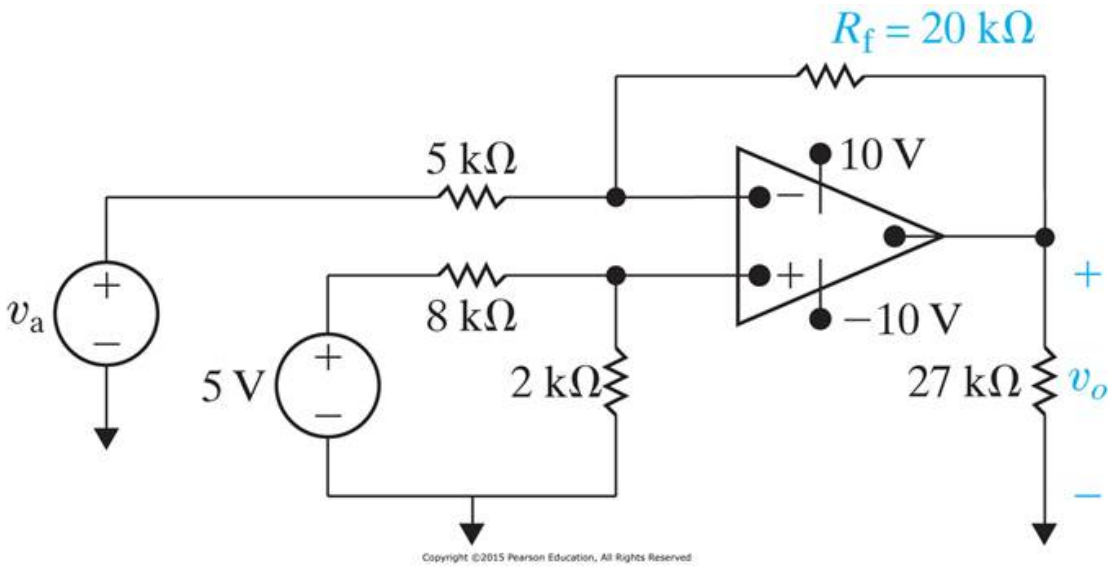
Correct

Marks for this submission: 5.0/5.0.

Question 8

Correct

Mark 5.0 out of 5.0



P5.26_10ed

Given: $v_a = 2V$

Find v_0.

v_o = -3 ✓ V

Numeric Answer

v_o = -3V

Correct

Marks for this submission: 5.0/5.0.

Question 9

Correct

Mark 5.0 out of 5.0

P6.08_9ed

The current in a 25 mH (milli Henry) inductor is known to be -10A for $t \leq 0^-$ and $-(10 \cos 400t + 5 \sin 400t)\, e^{-200t}$ A for $t \geq 0^+$.

At what instant of time is the voltage across the inductor maximum?

t_{max} = 2.77 ✓ msec (milli second)

What is the maximum voltage?

V_{max} = 64.27 ✓ V

Numeric Answer

t_{max} = 2.77 ms

v_{max} = 64.27 V

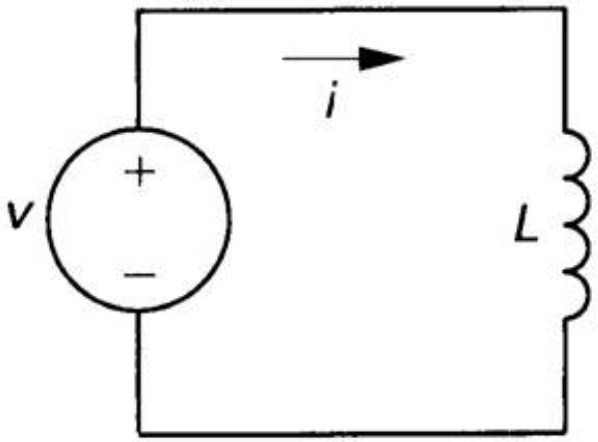
Correct

Marks for this submission: 5.0/5.0.

Question 10

Incorrect

Mark 0.0 out of 5.0



P6.10_6ed

Given: $v = 250 \sin(1{,}000\ t)$ Volts for $t \geq 0$

$L = 50$ mH (milli H) $\quad i(t = 0^-) = -5$ A

Find the current i(t) at t = 1 sec.

$i(t = 1\ s) =$ -3.472 ✗ A

Numeric Answer

i(t = 1 sec) = -2.812 A

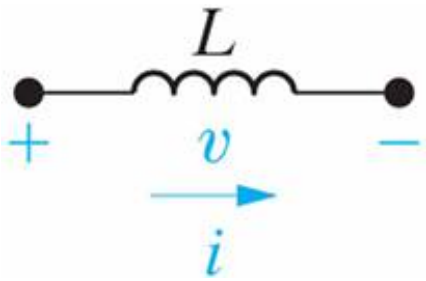
Incorrect

Marks for this submission: 0.0/5.0.

Question 11

Correct

Mark 5.0 out of 5.0



CQ6.08

Given:

L = 83 mH (milli Henry)

The inductor has a constant voltage of 28 V across it for a short while.

What is the change in current per milli sec during this period?

di/dt = ?? Amps/ms

Answer: 0.337

Calculated Question

The correct answer is: 0.337

Correct

Marks for this submission: 5.0/5.0.

Question 12

Partially correct

Mark 3.0 out of 5.0

P6.17_6ed

The voltage across the terminals of a 0.40 μF (micro F) capacitor is:

$V_C(t) = 25$ V for $t \leq 0$;

$V_C(t) = A_1\, t\, e^{-1{,}500t} + A_2\, e^{-1{,}500t}$ V for $t \geq 0$.

The initial current in the capacitor is 90 mA (milli Amp).

Assume the passive sign convention (current is in the direction of voltage drop).

a) What is the initial energy stored in the capacitor?

w(t = 0) = 125 ✓ mJ (micro J)

b) Find the coefficients A_1 and A_2.

A_1 = 262500 ✓ Volts/Sec

A_2 = 25 ✓ Volts/Sec

c) Find the capacitor current at t = 0.4 ms (milli sec).

i(t = 0.4 ms) = -12.62 ✗ mA (milli Amp)

d) Find the capacitor current at t = 2 ms (milli sec).

i(t = 2 ms) = -13.69 ✗ mA (milli Amp)

Numeric Answer

a) w(t= 0) = 125 mJ (micro J)

b) A_1 = 262,500 Volts/Sec A_2 = 25 Volts/sec

c) i(t = 0.4 ms) = 14.818 mA

d) i(t = 2 ms) = -11.202 mA

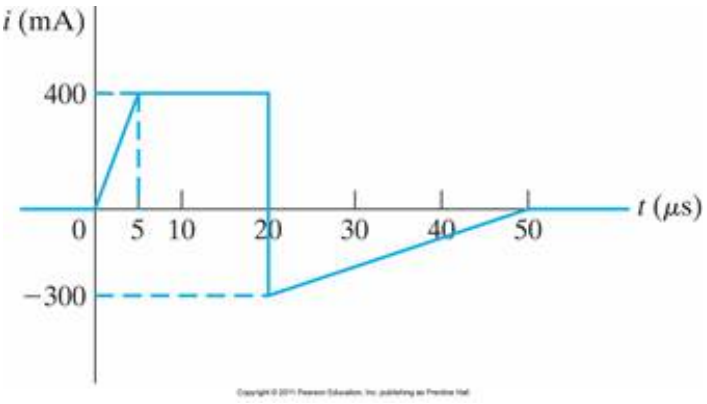
Partially correct

Marks for this submission: 3.0/5.0.

Question 13

Correct

Mark 5.0 out of 5.0



P6.14_9ed

The current shown in the figure is applied to a 0.25 μF (micro F) capacitor.

The initial voltage across the capacitor is zero.

Find the charge on the capacitor at t = 15 μs (micro sec).

Q_{15ms} = 5 ✓ μC (micro C)

Find the voltage across the capacitor at t = 15 μs (micro sec).

V_{15ms} = 20 ✓ V

Numeric Answer

Q_{15ms} = 5 μC (micro Coulombs)

V_{15ms} = 20 Volts

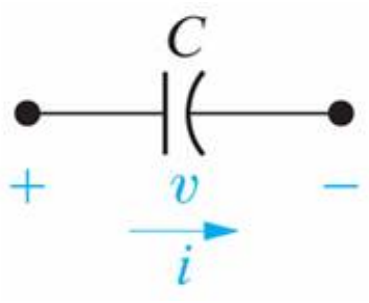
Correct

Marks for this submission: 5.0/5.0.

Question 14

Correct

Mark 5.0 out of 5.0



CQ6.11

Given:

C = 37 µF (micro Farad)

The capacitor has a constant current 88.5 Amps “through” it for a short while.

What is the change in voltage per µs (micro sec) during this period?

dv/dt = ?? Volts/µs (Volts per micro sec)

Answer: 2.39

Calculated Question

The correct answer is: 2.392

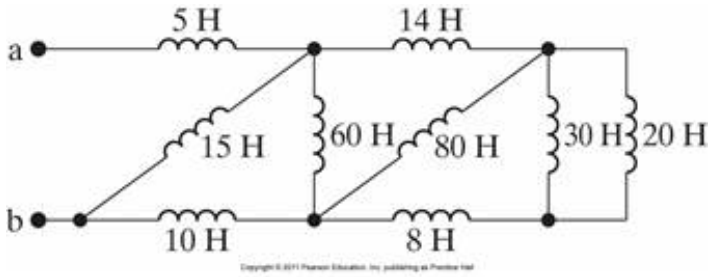
Correct

Marks for this submission: 5.0/5.0.

Question 15

Correct

Mark 5.0 out of 5.0



P6.20_9ed

Find the equivalent inductance with respect to the terminals a,b.

L_{Eq} = 15 ✓ H

Numeric Answer

L_{Eq} = 15 H

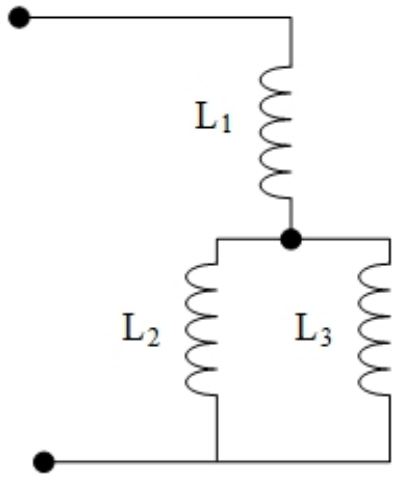
Correct

Marks for this submission: 5.0/5.0.

Question 16

Correct

Mark 5.0 out of 5.0



CQ6.06

Given:

L_1 = 1.3 mH (milli Henry) L_2 = 7.2 mH (milli Henry) L_3 = 3.1 mH (milli Henry)

Find the equivalent inductance L_{Eq}.

L_{Eq} = ?? mH (milli Henry)

Answer: 3.47

Calculated Question

The correct answer is: 3.467

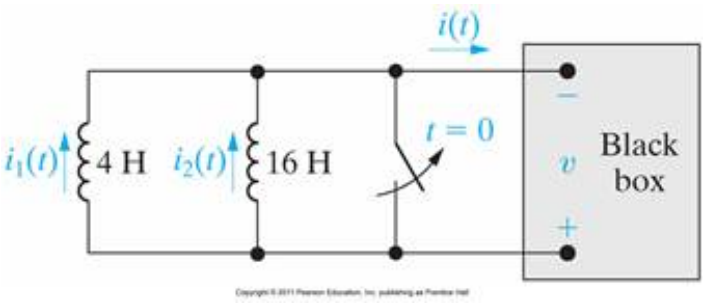
Correct

Marks for this submission: 5.0/5.0.

Question 17

Correct

Mark 5.0 out of 5.0



P6.25_9ed

Given: The voltage v (acoss all the parallel elements) is $64\ e^{-4t}$ Volts for $t > 0$.
And at $t = 0^-$ $i_1 = -10A$ and $i_2 = 5A$

a) Find the equivalent inductance of the two inductors in the figure.

L_{Eq} = 3.2 ✓ H

b) Find i(t) at t = 1sec.

i(t = 1s) = -91.58 ✓ mA (milli Amp)

Numeric Answer

a) $L_{Eq} = 3.2$ H

b) i(t = 1s) = -92 mA

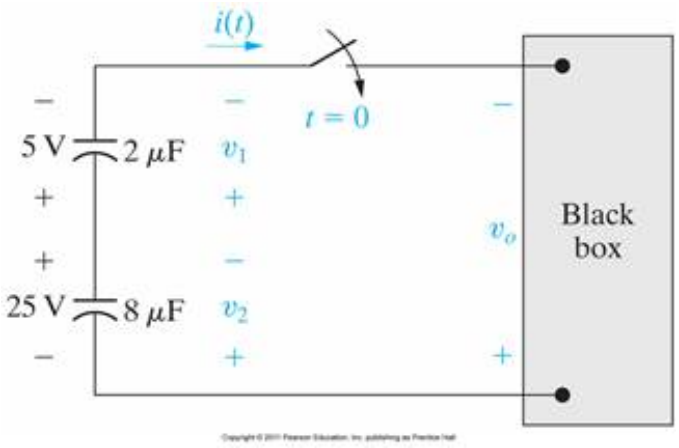
Correct

Marks for this submission: 5.0/5.0.

Question 18

Correct

Mark 5.0 out of 5.0



P6.31_9ed

The current i(t) is given as 800 e^{-25t} μA (micro Amp) for t > 0 with the initial voltages across the capacitors shown in the figure.

Find the equivalent capacitor of the two capacitors in the figure.

C_{Eq} = 1.6 ✓ μF (micro F)

Find $v_0(t)$ for t = 1ms (milli sec).

$v_o(t = 1ms)$ = -19.5 ✓ V

Numeric Answer

C_{Eq} = 1.6 μF

$v_o(t = 1ms)$ = -19.51V

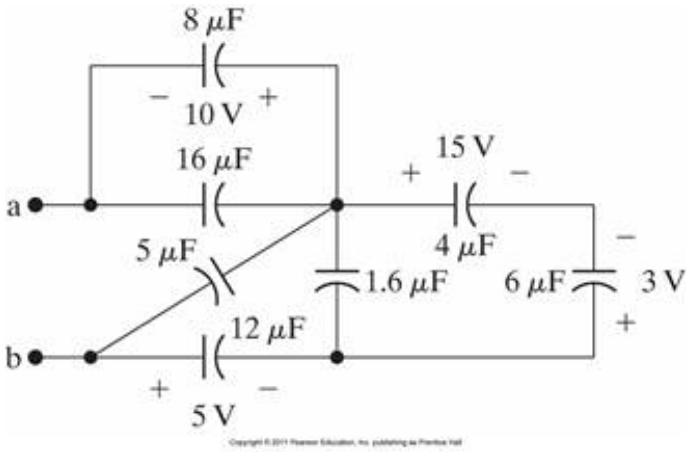
Correct

Marks for this submission: 5.0/5.0.

Question 19

Correct

Mark 5.0 out of 5.0



P6.27_9ed

Find the equivalent capacitance with respect to the terminals a,b.

C_{Eq} = 6 ✓ μF (micro F)

Find the initial voltage across the equivalent capacitance.

V_{Ceq} = -3 ✓ V

Numeric Answer

C_{Eq} = 6 μF (micro Farad)

V_{Ceq} = -3V

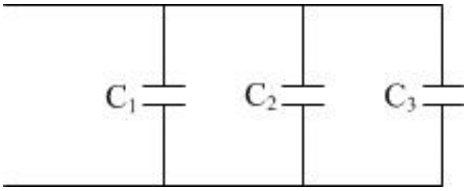
Correct

Marks for this submission: 5.0/5.0.

Question 20

Correct

Mark 5.0 out of 5.0



Given:

$C_1 = 2.3\ \mu F$ (micro F) $C_2 = 6.4\ \mu F$ (micro F) $C_3 = 6.8\ \mu F$ (micro F)

Find the equivalent capacitance C_{Eq}.

$C_{Eq} = ??\ \mu F$ (micro F)

Answer: 15.5

Calculated Question

The correct answer is: 15.500

Correct

Marks for this submission: 5.0/5.0.