Started on	Wednesday, 3 April 2019, 10:55 AM
State	Finished
Completed on	Wednesday, 3 April 2019, 11:37 AM
Time taken	41 mins 55 secs
Grade	**100.00** out of 100.00

Question 1

Correct

Mark 5.00 out of 5.00

Q1c

Find the Laplace Transform of $\left\{\frac{d}{dt}\left[e^{-at}\sin(\omega t)\right]\right\} \Leftrightarrow$

Select one:

a. $\frac{s\omega}{(s+a)^2+\omega^2}$ ✓

b. $\frac{-s^2}{(s+a)^2+\omega^2}$

c. $\frac{\omega^2}{(s+a)^2+\omega^2}$

d. $\frac{2sa}{(s+a)^2+\omega^2}$

Correct

Marks for this submission: 5.00/5.00.

Question 2

Correct

Mark 15.00 out of 15.00

Q2a

Given $F(s)=\frac{100(s^2+69)}{(s+10)(s^2+10s+169)}=\frac{100(s^2+69)}{(s+10)(s+5-j12)(s+5+j12)}$

Find the partial fraction expansion of F(s) and then use the Laplace transform tables to find f(t).

f(t) = [100 ✓ e -10 ✓ t + 83.33 ✓ e -5 ✓ t cos(12 ✓ t + 90 ✓ °] u(t)

Correct

Marks for this submission: 15.00/15.00.

Question 3

Correct

Mark 10.00 out of 10.00

Q3b

Given: $F(s)=\frac{10(s^2+40)}{(s+8)(s^2+12s+136)}$ which has an inverse transform f(t).

a) Find the initial value of f(t = 0).

f(t = 0) = 10 ✓

b) Find the final value of f(t → ∞)

f(t → ∞) = 0 ✓

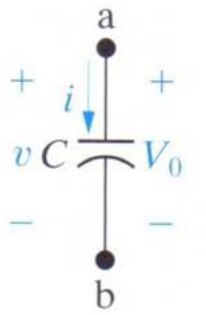
Correct

Marks for this submission: 10.00/10.00.

Question 4

Correct

Mark 10.00 out of 10.00



Q4b

Given: This capacitor has a value of 1 µF (micro F) and has an initial voltage of 45 V at $t = 0^-$.

Identify the Frequency Domain series form of the capacitor.

Select one:

a. $V = \frac{1}{s(1\times10^{-6})} + \frac{45}{s}$ ✓

b. $V = \frac{1}{s(1\times10^{-3})} + \frac{45}{s}$

c. $I = s(1\times10^{-6})V - 45\times10^{-6}$

d. $I = s(1\times10^{-3})V - 45\times10^{-3}$

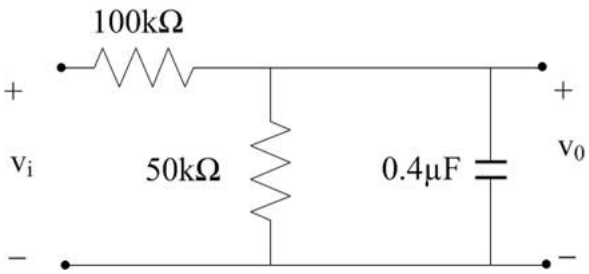
Correct

Marks for this submission: 10.00/10.00.

Question 5

Correct

Mark 15.00 out of 15.00



Q5c

Find the s domain transfer function $H(s) = V_0/V_i$ for this circuit.

H(s) = 25 ✓ / (s + 75 ✓)

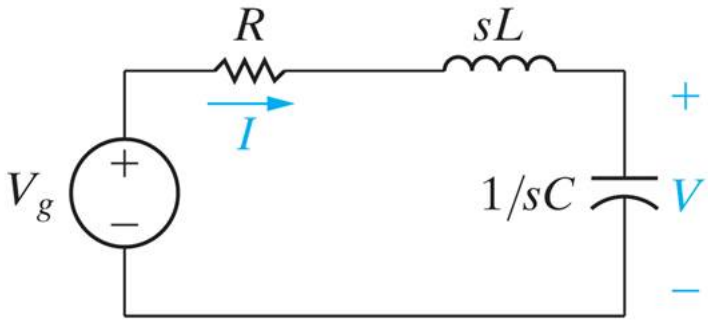
Correct

Marks for this submission: 15.00/15.00.

Question 6

Correct

Mark 15.00 out of 15.00



Q6a

Given: There is no energy stored in this circuit prior to t = 0.

The voltage source V_g = 10V for $t \geq 0^+$.

R = 125 Ω (Ohm) L = 1 H C = 1 mF (milli F)

Find defined voltage V in the s domain.

V(s) = 10000 ✓ / [s (s^2 + 125 ✓ s + 1000 ✓]

Correct

Marks for this submission: 15.00/15.00.

Question 7

Correct

Mark 15.00 out of 15.00

Q7d

Given: $F(s) = \frac{8(s^2-5s+50)}{s(s+10)}$

Find the partial fraction expansion of this transfer function.

F(s) = 40 ✓ / s + -160 ✓ / (s + 10)

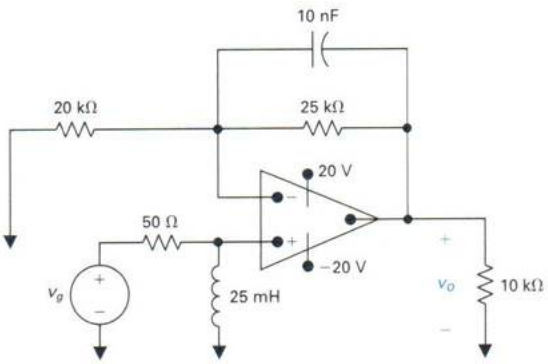
Correct

Marks for this submission: 15.00/15.00.

Question 8

Correct

Mark 15.00 out of 15.00



Q8c

Given: The opamp is ideal.

$$H(s) = \frac{V_0}{V_g} = \frac{s(s+9{,}000)}{(s+2{,}000)(s+4{,}000)}$$

Find the steady-state response when the input $v_g(t)$ = 12 cos(10,000 t) V.

$v_0(t)_{steady\text{-}state}$ = [14.69 ✓ cos (10000 ✓ t + -8.88 ✓ °)] u(t) V

Correct

Marks for this submission: 15.00/15.00.

◄ Quiz 7 - Chapter 13