Homework 4

Due Apr 18 at 11pm **Points** 10 **Questions** 10
Available Apr 12 at 8am - Apr 18 at 11pm **Time Limit** None
Allowed Attempts Unlimited

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	51 minutes	10 out of 10

ⓘ Correct answers are hidden.

Score for this attempt: **10** out of 10
Submitted Apr 17 at 4:48pm
This attempt took 51 minutes.

Question 1

1 / 1 pts

1. Solve iteratively (first three terms only)
   y[k+1] - 0.5 y[k] = 0 with y[-1] = 10

What is value of y[2]?

a. 5 b. 5.5 c. 1.25 d. None of above

- a
- b
- c

d

Question 2

1 / 1 pts

Solve the following equation iteratively (first three terms only)
y[k+1] + 2y[k] = f[k+1], with $f[k] = e^{-k}\ u[k]\ and\ y[-1] = 0$

What is value of y[1]?

a. 1 b. 0 c. -1.632 d. None of above

a

b

c

d

Question 3

1 / 1 pts

1. Solve the following equation iteratively:

y[k] – 0.6 y[k-1] – 0.16 y[k-2] = 0 with y[-1] = -25, y[-2] = 0

What is value of y[2]?

a. 0.76 b. -15 c. -10.2 d. None of above

a

b

- c
- d

Question 4

1 / 1 pts

Solve the following equation iteratively:
y[k+2] + 3 y[k+1] + 2 y[k] = f[k+2] + 3 f[k+1] + 3 f[k]
with $f[k] = 3^k u[k]$, y[-1] = 3, and y[-2] = 2.
What is value of y[2]?
a. -12 b. -63 c. 2 d. None of above

- a
- b
- c
- d

Question 5

1 / 1 pts

Find out the system response equation for the following system equation:
$y[k+2] + 3y[k+1] + 2y[k] = 0,\ if\ \ y[-1] = 0,\ y[-2] = 1$.
The system response solution is:
a. $y[k] = 2\,(-1)^k + (-4)\,(-2)^k,\ k \geq 0$
b. $y[k] = 3\,(-1)^k + \ (-2)^k,\ k \geq 0$
c. $y[k] = 3\,(-1)^k - \ (-2)^k,\ k \geq 0$
d. None of above

- a

b

c

d

Question 6

1 / 1 pts

Using the classical method to find the total response of a system specified by the equation

y[k + 2] – y[k+1] + 0.16 y[k] = f[k+1]

with the input f[k] is $f[k] = (0.5)^k u[k]$ and the auxiliary conditions

y[0] $= -\frac{5}{9}$, y[1] $= -\frac{7}{9}$.

a. $3 \times (0.2)^k + 2 \times (0.8)^k - 6 \times (0.5)^k, \quad k \geq 0$

b. $\frac{10}{3} \times (0.2)^k + \frac{5}{3} \times (0.8)^k - \frac{50}{9} \times (0.5)^k, \quad k \geq 0$

c. $4 \times (0.2)^k + 3 \times (0.8)^k - 8 \times (0.5)^k, \quad k \geq 0$

d. None of above

a

b

c

d

Question 7

1 / 1 pts

Calculate Laplace transform $F(s) = \int_0^{\infty} f(t)\, e^{-st} dt$ of the following equation and find the region of convergence (ROC).

$$\text{f(t)} = (\, e^{2t} - 2e^{-t})\, u(t)$$

a. $\frac{1}{s-2} - \frac{2}{s+1}, \quad ROC: \; Re(s) > 2$
b. $\frac{2}{s-2} - \frac{1}{s+1}, \quad ROC: \; Re(s) > 2$
c. $None\ of\ above.$

- (●) a
- ( ) b
- ( ) c

Question 8

1 / 1 pts

Find the inverse (unilateral) Laplace transform of the following functions:

$$\frac{2s + 5}{s^2 + 5\,s + 6}$$

$a.$ $f(t) = (\, e^{-2t} + e^{-3t}\,)u(t)$
$b.$ $f(t) = (\, e^{-5t} + e^{-6t}\,)u(t)$
$c.$ $f(t) = (\, e^{-t} + 2\, e^{-5t}\,)u(t)$
$d.$ $None\ of\ above$

- (●) a
- ( ) b
- ( ) c
- ( ) d

Question 9

1 / 1 pts

Find the inverse (unilateral) Laplace transform of the following functions:

$$\frac{3s+5}{s^2+4s+13}$$

a. $f(t) = 3.018e^{-2t}\cos(3t + 6.34^o)\,u(t)$
b. $f(t) = 5e^{-3t}\cos(3t + 6.34^o)\,u(t)$
c. $f(t) = 5e^{-3t}\cos(4t)\,u(t)$
d. $None\ of\ above$

- (●) a
- ( ) b
- ( ) c
- ( ) d

Question 10

1 / 1 pts

Find the inverse (unilateral) Laplace transform of the following functions:

$$\frac{s+2}{s\,(s+1)^2}$$

a. $f(t) = (2 - 2e^{-t} - t\,e^{-t})u(t)$
b. $f(t) = (2 - 4e^{-t} - 2t\,e^{-t})u(t)$
c. $f(t) = (2 - e^{-t} - t\,e^{-t})u(t)$
d. $None\ of\ above$

- (●) a
- ( ) b
- ( ) c

d

Quiz Score: **10** out of 10