Assignment 2

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

1) The response of a system to an external input is called
   - forced response
   - transient response
   - free response
   - steady state response

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: forced response

2) A second order system is governed by \( y(t) - 2y(t) = u(t) \). Its transfer function is

   \[
   \frac{1}{s^2 + 2}
   \]
   \[
   \frac{1}{s^2 - 2}
   \]
   \[
   \frac{1}{s^2 - 2s + 2}
   \]
   \[
   \frac{1}{s^2 - 2s}
   \]

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: 

3) The transfer function of a causal system/plant is

   - proper
   - linear
   - improper
   - non-unique

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: proper

4) The poles of the transfer function of the system whose governing equation is \( y(t) - 3y(t) - 4y(t) = \dot{u}(t) + 2a(t) + 2a(t) \), are

   - -1, -3
   - 1, 3
   - 1, -4
   - -1, 4

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: -1, 4

Due on 2019-08-21, 23:59 IST.
5) The zeros of the transfer function of the system whose governing equation is \( y(t) - 3y(t) - 4y(t) = u(t) + 2u(t) + 2u(t) \), are

- 2, -1
- 2, 1
-1+j, -1-j
-2+j, -2-j

No, the answer is incorrect.
Score: 0
Accepted Answers:
-1+j, -1-j

Questions 6-8: Calculate the expression for the unit step response of the system whose governing equation is \( \dot{y}(t) + 6\dot{y}(t) + 5y(t) = u(t) \).

6) The steady state value of the output (as time tends to infinity) is

- 1
- 0.5
- 0.2
- 0.1

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.2

7) The coefficient of the \( e^{-2t} \) term in the output function is

- 0.25
- 0.25
- 0.5
- 0.5

No, the answer is incorrect.
Score: 0
Accepted Answers:
-0.25

8) The coefficient of the \( e^{-5t} \) term in the output function is

- 0.05
- 0.25
- 0.5
- 1

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.05

Questions 9-10: Calculate the unit step response of the system whose governing equation is \( \dot{y}(t) + 5\dot{y}(t) = u(t) \).

9) The steady state value of the output (as time tends to infinity) is

- 1
- 0.5
- 0.2
- infinity

No, the answer is incorrect.
Score: 0
Accepted Answers:
infinity

10) The coefficient of the \( e^{-5t} \) term in the output function is

- 0.2
- 0.2
- 0.04
- 0.25

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.04

11) Consider the system whose governing equation is \( \dot{y}(t) + 4\dot{y}(t) = u(t) \). The input for which the system output would be unbounded is

- 1
- \( \sin(2t) \)
- \( \cos(\sqrt{2}t) \)
- \( \sin(t) \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
\( \sin(2t) \)
12) Consider the system whose governing equation is \( y(t) + 3y(t) = u(t) \). The input for which the system output would be unbounded is

- 1
- \( \cos(3t) \)
- \( \sin(\sqrt{3}t) \)
- \( \cos(t) \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
1

13) Consider the system whose governing equation is \( y(t) + 4y(t) + 4y(t) = u(t) \). The system output would be unbounded for

- only \( u(t) = 1 \)
- only \( u(t) = \cos(2t) \)
- any bounded input
- only \( u(t) = \cos(4t) \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
any bounded input

14) Consider the system whose governing equation is \( y(t) + 2y(t) - 3y(t) = u(t) \). The system output would be unbounded for

- only \( u(t) = 1 \)
- only \( u(t) = \cos(3t) \)
- any bounded input
- only \( u(t) = \sin(t) \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
any bounded input

15) Consider the system whose governing equation is \( y(t) + 8y(t) + 22y(t) + 24y(t) + 9y(t) = u(t) \). Which ONE of the following statements is TRUE?

- The multiplicity of the -1 pole and -3 pole is 1 and 2 respectively
- The multiplicity of the -1 pole and -3 pole is 2 and 1 respectively
- The multiplicity of the -1 pole and -3 pole is 1 and 1 respectively
- The multiplicity of the -1 pole and -3 pole is 2 and 2 respectively

No, the answer is incorrect.
Score: 0
Accepted Answers:
The multiplicity of the -1 pole and -3 pole is 2 and 2 respectively