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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Control systems (course)

Announcements (announcements) About the Course (preview) Ask a Question (forum) Progress (student/home) Mentor (student/mentor)

Unit 4 - Week 2

Course outline

How to access the portal

Pre-requisite Assignment

Week 1

Week 2

- Transfer Function - Part 1 (unit?unit=16&lesson=17)
- Transfer Function- Part 2 (unit?unit=16&lesson=18)
- System Response - Part 1 (unit?unit=16&lesson=19)
- System Response- Part 2 (unit?unit=16&lesson=20)
- BIBO Stability - Part 1 (unit?unit=16&lesson=21)
- BIBO Stability- Part 2 (unit?unit=16&lesson=22)
- Quiz : Assignment 2 (assessment?name=124)
- WEEK 2 - Assignment Solution (unit?unit=16&lesson=23)
- Week 2 - Feedback: Control systems (unit?unit=16&lesson=24)

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

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Assignment 2

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

Due on 2019-08-21, 23:59 IST.

1) The response of a system to an external input is called 1 point

- 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 $\ddot{y}(t) - 2\dot{y}(t) = u(t)$. Its transfer function is 1 point

- $\frac{1}{s^2 + 2}$
- $\frac{1}{s^2 - 2}$
- $\frac{1}{s^2 - 2s}$
- $\frac{1}{s^2 - 2s + 2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\frac{1}{s^2 - 2s}$

3) The transfer function of a causal system/plant is 1 point

- 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 $\ddot{y}(t) - 3\dot{y}(t) - 4y(t) = \ddot{u}(t) + 2\dot{u}(t) + 2u(t)$, are 1 point

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

No, the answer is incorrect.
Score: 0

Accepted Answers:
-1, 4

- 5) The zeros of the transfer function of the system whose governing equation is $\ddot{y}(t) - 3\dot{y}(t) - 4y(t) = \ddot{u}(t) + 2\dot{u}(t) + 2u(t)$, are 1 point
- 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 point
- 1
 0.5
 0.2
 0.1
- No, the answer is incorrect.
Score: 0
Accepted Answers:
0.2
- 7) The coefficient of the e^{-t} term in the output function is 1 point
- 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 1 point
- 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 point
- 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 1 point
- 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 $\dot{y}(t) + 4y(t) = u(t)$, The input for which the system output would be unbounded is 1 point
- 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 $\ddot{y}(t) + 3\dot{y}(t) = u(t)$, The input for which the system output would be unbounded is **1 point**

- 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 $\ddot{y}(t) + 4\dot{y}(t) + 4y(t) = u(t)$. The system output would be unbounded for **1 point**

- 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 $\ddot{y}(t) + 2\dot{y}(t) - 3y(t) = u(t)$, The system output would be unbounded for **1 point**

- 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 $\ddot{y}(t) + 8\dot{y}(t) + 22\ddot{y}(t) + 24\dot{y}(t) + 9y(t) = u(t)$. Which ONE of the following statements is **1 point** 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