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reviewer3@nptel.iitm.ac.in

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 3 - Week 1

Course outline

How to access the portal

Pre-requisite Assignment

Week 1

- Introduction to Control Systems - Part 1 (unit?unit=6&lesson=7)
- Introduction to Control Systems - Part 2 (unit?unit=6&lesson=8)
- Overview of Feedback Control Systems - Part 1 (unit?unit=6&lesson=9)
- Overview of Feedback Control Systems- Part 2 (unit?unit=6&lesson=10)
- Mathematical Preliminaries - Part 1 (unit?unit=6&lesson=11)
- Mathematical Preliminaries- Part 2 (unit?unit=6&lesson=12)
- LECTURE NOTES (unit?unit=6&lesson=13)
- WEEK 1 - Assignment Solution (unit?unit=6&lesson=14)
- Week 1 - Feedback: Control systems (unit?unit=6&lesson=15)
- Quiz : Assignment 1 (assessment?name=123)**
- New Lesson (unit?unit=6&lesson=135)

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Assignment 1

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

Due on 2019-08-14, 23:59 IST.

- 1) A causal system is always **1 point**
- anticipative
 - linear
 - non-anticipative
 - nonlinear
- No, the answer is incorrect.
Score: 0
Accepted Answers:
non-anticipative
- 2) A system whose governing equation is $y(t) = tu(t)$, is **1 point**
- linear and time invariant
 - linear and time varying
 - nonlinear and time invariant
 - nonlinear and time varying
- No, the answer is incorrect.
Score: 0
Accepted Answers:
linear and time varying
- 3) Consider a washing machine unit to which an electric current is provided as input and the rotational speed of the drum is the output. Then, if one wants to find a mathematical relationship between the electric current input and the drum rotational speed output, then one is solving the problem of **1 point**
- synthesis
 - prediction
 - control
 - estimation
- No, the answer is incorrect.
Score: 0
Accepted Answers:
synthesis
- 4) Which one of the following is an example of open loop control? **1 point**
- Air conditioner
 - Servo motor
 - Water tank level control
 - Ceiling fan
- No, the answer is incorrect.
Score: 0
Accepted Answers:
Ceiling fan
- 5) When the mapping in the feedback path is not equal to one, it is called as **1 point**
- non-unity feedback
 - negative feedback
 - unity feedback
 - positive feedback
- No, the answer is incorrect.
Score: 0
Accepted Answers:

Week 11

Week 12

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non-unity feedback

6) In a typical closed loop system layout, the element that takes the controller output and realizes the same to provide it as the system input is called **1 point** as the

- plant
- controller
- actuator
- sensor

No, the answer is incorrect.
Score: 0

Accepted Answers:
actuator

7) The dynamics of the element that measures the output of the system and provides feedback is called as **1 point**

- plant dynamics
- controller dynamics
- sensor dynamics
- actuator dynamics

No, the answer is incorrect.
Score: 0

Accepted Answers:
sensor dynamics

8) The class of linear time varying causal SISO dynamic systems is typically characterized by **1 point**

- linear ODEs with constant coefficients
- nonlinear ODEs with constant coefficients
- linear ODEs with time varying coefficients
- nonlinear ODEs with time varying coefficients

No, the answer is incorrect.
Score: 0

Accepted Answers:
linear ODEs with time varying coefficients

9) A mass spring damper system is governed by $\ddot{x}(t) + x(t)\dot{x}(t) + x(t) = f(t)$. This system is **1 point**

- nonlinear
- linear
- time varying
- non-causal

No, the answer is incorrect.
Score: 0

Accepted Answers:
nonlinear

10) The complex function $\frac{1}{s^2 + 2s + 1}$ is singular at **1 point**

- only $s = -1$
- only $s = -2$
- $s = -1$ and $s = -2$
- $s = -3$

No, the answer is incorrect.
Score: 0

Accepted Answers:
only $s = -1$

11) The Laplace transform of $e^{-t} \sin(2t)$ is **1 point**

- $\frac{1}{s + 1}$
- $\frac{2}{s^2 + 4}$
- $\frac{2}{s^2 + 2s + 5}$
- $\frac{2}{(s + 1)^2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\frac{2}{s^2 + 2s + 5}$

Questions 12-15: Consider the LTI system whose governing equation is $\ddot{y}(t) + 3\dot{y}(t) - 4y(t) = u(t)$. Take the initial conditions to be zero and let a unit step input be provided to this system.

12) The value of the output as time tends to infinity is

1 point

- 0.25
- 0.5
- 1
- infinity

No, the answer is incorrect.

Score: 0

Accepted Answers:

infinity

13) The coefficient of e^t in the output function is

1 point

- 0.2
- 1
- 0.5
- 0.5

No, the answer is incorrect.

Score: 0

Accepted Answers:

0.2

14) The coefficient of e^{-4t} in the output function is

1 point

- 0.25
- 0.2
- 0.05
- 0.5

No, the answer is incorrect.

Score: 0

Accepted Answers:

0.05

15) Which ONE of the following statements is FALSE?

1 point

- The output is bounded in magnitude for all time
- The only functions of time that appear in the output function are exponential functions.
- The value of the output function is zero when time is zero.
- The value of the output is non-zero as time tends to infinity

No, the answer is incorrect.

Score: 0

Accepted Answers:

The output is bounded in magnitude for all time