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

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Unit 8 - Week 6

Assignment 6

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

Due on 2019-09-11, 23:59 IST.

1) Consider a second order plant governed by $\ddot{y}(t)+4\dot{y}(t)+3y(t)=u(t)$. It is desired to design a unity negative feedback closed loop control system with this plant using a proportional controller. Then, closed loop stability would be achieved for all ***1 point***

- $K_p > 0$
- $K_p < 4$
- $K_p > -4$
- $K_p > -3$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$K_p > -3$

2) The open loop transfer function in problem 1 is of ***1 point***

- Type 0
- Type 1
- Type 2
- Type 3

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

3) The static position error constant for problem 1 is ***1 point***

- infinity
- K_p
- $K_p/3$
- $-K_p/4$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$K_p/3$

4) The steady state tracking error when the stable closed loop system of problem 1 is provided a unit step reference input is ***1 point***

- 0
- $\frac{3}{K_p+3}$
- $\frac{K_p}{4-K_p}$
- K_p

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No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{3}{K_p + 3}$

5) The steady state tracking error when the stable closed loop system of problem 1 is provided a unit ramp reference input is *1 point*

- 0
- $\frac{K_p}{K_p + 4}$
- $\frac{4}{K_p}$
- infinity

No, the answer is incorrect.
Score: 0

Accepted Answers:
infinity

6) The static acceleration error constant for problem 1 is *1 point*

- infinity
- $K_p/3$
- 0
- $-K_p/4$

No, the answer is incorrect.
Score: 0

Accepted Answers:
0

7) The open loop transfer function of a unity negative feedback closed loop system is $\frac{s+1}{s^2+4s}$.For the closed loop system, s = -1 satisfies *1 point*

- both the magnitude condition and the angle condition.
- the magnitude condition but not the angle condition
- the angle condition but not the magnitude condition.
- neither the magnitude condition nor the angle condition.

No, the answer is incorrect.
Score: 0

Accepted Answers:
neither the magnitude condition nor the angle condition.

8) Let the open loop transfer function of a negative feedback closed loop system be $\frac{K(s+1)}{s^3+2s^2+2s}$ where K is a non-negative real valued parameter. Then, which ONE of the following statements is TRUE about the locus of the closed loop poles? *1 point*

- It would have 3 branches, 2 of which would terminate at open loop poles.
- It would have 3 branches, 1 of which would terminate at an open loop zero.
- It would have 4 branches, 2 of which would terminate at open loop poles.
- It would have 3 branches, all of which terminate at open loop poles.

No, the answer is incorrect.
Score: 0

Accepted Answers:
It would have 3 branches, 1 of which would terminate at an open loop zero.

9) In problem 8), the complex conjugate open loop poles are located at *1 point*

- -1+2j and -1-2j
- 1.414j and -1.414j
- -1+j and -1-j
- -2+2j and -2-2j

No, the answer is incorrect.
Score: 0

Accepted Answers:
-1+j and -1-j

10) In problem 8, the region of the real axis that lies on the root locus is *1 point*

- $(0, 2)$
- $(-1, 0)$
- $(-\infty, -1)$
- $(0, \infty)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(-1, 0)$

11) In problem 8, the number of asymptotes is **1 point**

- 1
- 2
- 3
- 4

No, the answer is incorrect.
Score: 0

Accepted Answers:
2

12) In problem 8, the angles (in °) made by the asymptotes with the positive real axis are **1 point**

- 0 and 90
- 0 and 180
- 90 and 270
- 90 and 180

No, the answer is incorrect.
Score: 0

Accepted Answers:
90 and 270

13) In problem 8, the point of intersection of the asymptotes is **1 point**

- 0
- 0.5
- -3
- -0.5

No, the answer is incorrect.
Score: 0

Accepted Answers:
-0.5

14) Which ONE of the following statements is TRUE about problem 8 ? **1 point**

- There is a break-in point between -1 and 0
- There is a break-away point between 0 and 2
- There is a break-away point between -1 and 0
- There are no break-away and break-in points

No, the answer is incorrect.
Score: 0

Accepted Answers:
There are no break-away and break-in points

15) In problem 8, the closed loop system would be stable for all **1 point**

- K > 0
- K < 0
- K < 1
- K < 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
K > 0