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# Unit 9 - Week 7



# Assignment 7

**The due date for submitting this assignment has passed.** **Due on 2019-09-18, 23:59 IST.**
**As per our records you have not submitted this assignment.**

1) 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-positive real valued parameter. Consider the locus of the corresponding closed loop poles. The region of the real axis that does not lie on the root locus is *1 point*

- (0, 2)
- (-1, 0)
- (-∞, -1)
- (0, ∞)

No, the answer is incorrect.
Score: 0
Accepted Answers:
*(-1, 0)*

2) In problem 1, which ONE of the following statements is TRUE about the locus of the closed loop poles? *1 point*

- It would have 3 asymptotes
- It would have the positive real axis as the only asymptote
- It would have the negative real axis as the only asymptote
- It would have both the positive real axis and the negative real axis as asymptotes

No, the answer is incorrect.
Score: 0
Accepted Answers:
*It would have both the positive real axis and the negative real axis as asymptotes*

3) In problem 1, which ONE of the following statements is TRUE about the locus of the closed loop poles? *1 point*

- It has exactly one break-in point
- It has exactly one break-away point
- It has both a break-away and a break-in point
- It neither has a break-away point nor a break-in point

No, the answer is incorrect.
Score: 0
Accepted Answers:
*It has exactly one break-in point*

4) In problem 1, the angle of departure (in °) of the root locus branch from the open loop at pole at -1+*j* is *1 point*

- 45
- 90
- 135
- 225

No, the answer is incorrect.
Score: 0
Accepted Answers:
*225*

5) The closed loop system of problem 1 is stable for *1 point*

- all $K < 0$
- all $K < -1$
- all $K < -2$

- no value of $K < 0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
*no value of $K < 0$*

6) If one had positive feedback in problem 1 with everything else remaining the same, which one of the following statements is TRUE? **1 point**

- The locus of closed loop poles would have only one asymptote
- The closed loop system would be stable for all K < 0
- The locus of closed loop poles would have only one break-away point
- The locus of closed loop poles would partly lie in the right half complex plane

No, the answer is incorrect.
Score: 0
Accepted Answers:
*The closed loop system would be stable for all K < 0*

7) Let the open loop transfer function of a positive feedback closed loop system be $\frac{K(s-2)}{(s^2+4s+3)}$ where $K$ is a non-negative real valued parameter. Consider the corresponding locus of closed loop poles. Which one of the following statements is TRUE? **1 point**

- The region (-∞, -3) lies on the root locus
- The region (-∞, -4) lies on the root locus
- The region (-3, -1) lies on the root locus
- The region (-1, 2) lies on the root locus

No, the answer is incorrect.
Score: 0
Accepted Answers:
*The region (-3, -1) lies on the root locus*

8) In problem 7, which ONE of the following statements is TRUE about the locus of the closed loop poles? **1 point**

- It would have 2 asymptotes
- It would not have any asymptotes
- It would have the negative real axis as the only asymptote
- It would have the positive real axis as the only asymptote

No, the answer is incorrect.
Score: 0
Accepted Answers:
*It would have the positive real axis as the only asymptote*

9) In problem 7, the break-away point is at **1 point**

- -1.87
- -0.31
- 1.56
- 5.87

No, the answer is incorrect.
Score: 0
Accepted Answers:
*-1.87*

10) In problem 7, the value of $K$ at the break-away point is **1 point**

- 0.1
- 0.25
- 1.65
- 14.5

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

11) In problem 7, the break-in point is at **1 point**

- -1.87
- -0.31
- 1.56
- 5.87

No, the answer is incorrect.
Score: 0
Accepted Answers:
*5.87*

12) In problem 7, the value of $K$ at the break-in point is **1 point**

- 0.1
- 0.54
- 2.25

15.7

No, the answer is incorrect.
Score: 0

Accepted Answers:
*15.7*

13) In problem 7, the cross-over points are at **1 point**

- *j, -j*
- *1.5j, -1.5j*
- *2.65j, -2.65j*
- *3.32j, -3.32j*

No, the answer is incorrect.
Score: 0

Accepted Answers:
*3.32j, -3.32j*

14) In problem 7, the value of $K$ at the cross-over points is **1 point**

- 2
- 4
- 6
- 10

No, the answer is incorrect.
Score: 0

Accepted Answers:
*4*

15) The closed loop system of problem 7 is stable for all **1 point**

- $K > 0$
- $K > 2$
- $K < 4$
- $K < 8$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$K < 4$