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[NPTEL \(https://swayam.gov.in/explorer?ncCode=NPTEL\)](https://swayam.gov.in/explorer?ncCode=NPTEL) » **Control systems (course)**
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Unit 11 - Week 9

Course outline

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Pre-requisite Assignment

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Week 3

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Week 9

 Bode Plot 1 - Part 1 (unit? unit=80&lesson=81)

 Bode Plot 1- Part 2 (unit? unit=80&lesson=82)

 Bode Plot 2 - Part 1 (unit? unit=80&lesson=83)

 Bode Plot 2- Part 2 (unit? unit=80&lesson=84)

 Bode Plot 3 - Part 1 (unit? unit=80&lesson=85)

 Bode Plot 3- Part 2 (unit? unit=80&lesson=86)

 Week 9 Feedback : Control systems (unit? unit=80&lesson=87)

 Quiz : Assignment 9 (assessment?name=131)

 Assignment 9 solution (unit? unit=80&lesson=88)

Week 10

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Week 12

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Assignment 9

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

Due on 2019-10-02, 23:59 IST.

1) In the y-axis of the magnitude plot of the Bode plot, the magnitude of the sinusoidal transfer function $P(j\omega)$ is expressed as 1 point

$$\log_{10}|P(j\omega)|$$

$$20 \log_{10}|P(j\omega)|$$

$$10 \log_{10}|P(j\omega)|$$

$$2 \log_{10}|P(j\omega)|$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$20 \log_{10}|P(j\omega)|$$

2) Which ONE of the following is NOT CORRECT about using a logarithmic scale for plotting frequency in the Bode plot? 1 point

A larger range of frequency can be represented

The lower frequency ranges can be expanded

Zero frequency can be represented

If point C is exactly halfway between points A and B, the value of frequency at point C is the geometric mean of the corresponding values at points A and B

No, the answer is incorrect.

Score: 0

Accepted Answers:

Zero frequency can be represented

3) If a plant transfer function is expressed as $\frac{f(s)}{g(s)}$ the magnitude (in dB) of the plant sinusoidal transfer function is 1 point

$$\log_{10}|f(j\omega)| + \log_{10}|g(j\omega)|$$

$$20 \log_{10}|f(j\omega)| + 20 \log_{10}|g(j\omega)|$$

$$\log_{10}|f(j\omega)| - \log_{10}|g(j\omega)|$$

$$20 \log_{10}|f(j\omega)| - 20 \log_{10}|g(j\omega)|$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$20 \log_{10}|f(j\omega)| - 20 \log_{10}|g(j\omega)|$$

4) In problem 3, the phase (in $^\circ$) of the plant sinusoidal transfer function is 1 point

$$\log_{10}(\angle f(j\omega)) + \log_{10}(\angle g(j\omega))$$

$$\log_{10}(\angle f(j\omega)) - \log_{10}(\angle g(j\omega))$$

$$\angle f(j\omega) - \angle g(j\omega)$$

$$\angle f(j\omega) + \angle g(j\omega)$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$\angle f(j\omega) - \angle g(j\omega)$

5) Consider $P(s) = 10$. Then, the magnitude (in dB) and phase (in $^\circ$) of the corresponding sinusoidal transfer function are respectively

1 point

- 20 and 180
- 20 and 0
- 20 and 0
- 20 and 180

No, the answer is incorrect.

Score: 0

Accepted Answers:

20 and 0

6) The slope of the magnitude plot (in dB/octave) of $\frac{1}{j\omega}$ is

1 point

- 20
- 20
- 6
- 6

No, the answer is incorrect.

Score: 0

Accepted Answers:

-6

7) The corner frequency (in rad/s) of the transfer function $\frac{1}{2s + 1}$ is

1 point

- 2
- 1
- 0.5
- 4

No, the answer is incorrect.

Score: 0

Accepted Answers:

0.5

8) The magnitude (in dB) of the sinusoidal transfer function corresponding to problem 7 as the frequency tends to zero is

1 point

- 2
- 0.5
- 0
- 6

No, the answer is incorrect.

Score: 0

Accepted Answers:

0

9) The phase (in $^\circ$) of the sinusoidal transfer function corresponding to problem 7) at the corner frequency is

1 point

- 0
- 45
- 60
- 90

No, the answer is incorrect.

Score: 0

Accepted Answers:

-45

10) The corner frequency (in rad/s) of the transfer function $2s + 4$ is

1 point

- 2
- 1
- 0.5
- 4

No, the answer is incorrect.

Score: 0

Accepted Answers:

2

11) The magnitude (in dB) of the sinusoidal transfer function corresponding to problem 10) as the frequency tends to zero is

1 point

- 12
- 0
- 6
- 20

No, the answer is incorrect.

Score: 0

Accepted Answers:

12

12) The phase (in °) of the sinusoidal transfer function corresponding to problem 10) at the corner frequency is

1 point

- 0
- 45
- 6
- 90

No, the answer is incorrect.

Score: 0

Accepted Answers:

45

13) Consider a plant whose transfer function is $\frac{1}{s^2 + 3s + 9}$. The magnitude (in dB) of the low frequency asymptote in the magnitude plot of the corresponding sinusoidal transfer function is

1 point

- 12
- 19.1
- 6
- 9

No, the answer is incorrect.

Score: 0

Accepted Answers:

-19.1

14) In problem 13, the corner frequency (in rad/s) of the sinusoidal transfer function is

1 point

- 1
- 2
- 3
- 0.5

No, the answer is incorrect.

Score: 0

Accepted Answers:

3

15) In problem 13, the resonant frequency (in rad/s) of the sinusoidal transfer function is

1 point

- 2.12
- 2
- 3
- 1.732

No, the answer is incorrect.

Score: 0

Accepted Answers:

2.12

16) Consider system 1 and system 2 whose plant transfer functions are respectively $\frac{s+2}{s+1}$ and $\frac{2-s}{s+1}$. Which ONE of the following statements is FALSE about the corresponding sinusoidal transfer functions?

1 point

- The high frequency magnitude value of the sinusoidal transfer function of system 1 tends to 0 dB
- The high frequency magnitude value of the sinusoidal transfer function of system 2 tends to 0 dB
- The high frequency phase value of the sinusoidal transfer function of system 1 tends to 0°
- The high frequency phase value of the sinusoidal transfer function of system 2 tends to 0°

No, the answer is incorrect.

Score: 0

Accepted Answers:

The high frequency phase value of the sinusoidal transfer function of system 2 tends to 0°

