

Name

KHALID KHAN *

ID

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13880 *

Program

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B-TECH (E) *

SEMESTER

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6TH *

SUBJECT

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CONTROL TECHNOLOGY *

SUBMITTED TO

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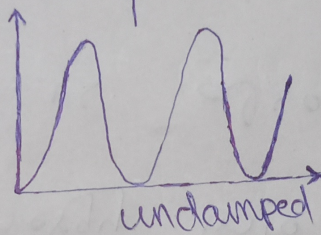
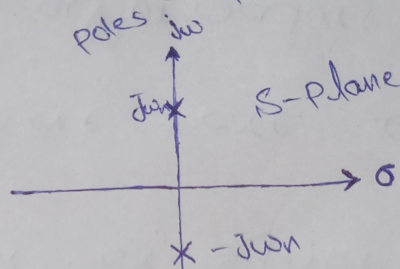
ENGR. M. AAMIR
AMAN *

"ASSIGNMENT"

Q: ~~Q~~

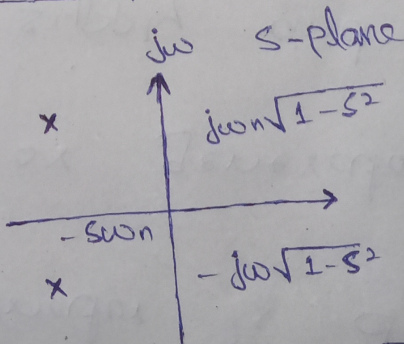
ANS: \rightarrow Undamped Natural frequency

$$G(s) = \frac{K\omega_n^2}{s^2 + 2s\zeta\omega_n + \omega_n^2}$$



$$s_{1,2} = \frac{-\zeta\omega_n \pm \omega_n \sqrt{\zeta^2 - 1}}{1}$$

underdamped \Rightarrow



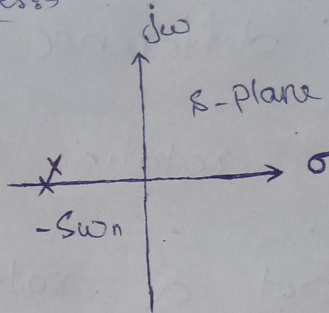
$$s_{1,2} = \frac{-\zeta\omega_n \pm \omega_n \sqrt{\zeta^2 - 1}}{1}$$

Ikhaid Khan
Critically

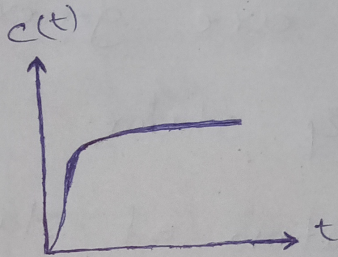
damped $\zeta \rightarrow$
poles \rightarrow

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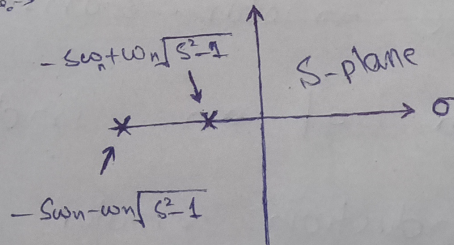
Step response \rightarrow



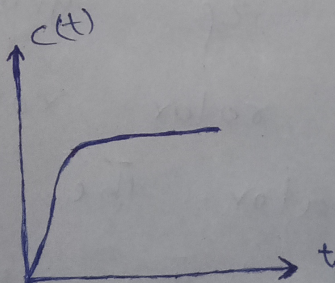
$$S_{1,2} = -S_w n \pm \omega_n \sqrt{\zeta^2 - 1}$$

Overs damped $\zeta \rightarrow$

Roots \rightarrow



Response \rightarrow



$$S_{1,2} = -S_w n \pm \omega_n \sqrt{\zeta^2 - 1}$$

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→ Underdamped :->

- * Oscillatory response.
- * No steady-state error.

→ Critically damped :->

- * Mono-incremental response.
- * No oscillation.
- * No steady-state error.

→ Overdamped :->

- * Mono-incremental response.
- * Slower than critically damped.
- * No oscillation.
- * No steady-state error.