

Moderate

Assistant Engineer (Electrical), Class 2025

Building Department

Assertion (A): A PI controller increases the order of the system by units but decreases the steady state error. Reason (R): A PI controller introduces a pole at either

A

Both (A) and (R) are true and (R) is the correct explanation of

B

Both (A) and (R) true but (R) is not the correct explanation of

C

(A) is true but (R) is false

Correct**D**

(A) is false but (R) is true

Correct Answer: C

Full Detailed Explanation

Concept & Reasoning The PI transfer function is $K_p + K_i/s = K_p(s + K_i/K_p)/s$. It introduces one pole at $s=0$ and one zero at $s= -K_i/K_p$. The integrator raises low-frequency gain and can improve steady-state accuracy, but it also changes transient/stability characteristics. Reading pole versus zero correctly is the key to the assertion-reason pair. How to Solve It in the Exam PI = pole at origin + finite zero. Important Exam Point Separate the roles of the integrator pole and controller zero. Editorial / Answer-Key Note The official GPSC final answer key revised the provisional outcome for this question from A to C. Related Revision Path This question sits in the revision path Control Systems → Controllers → PI Controller .

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