Medium | Deputy Executive Engineer (Electric | 2026 | orts Authority of Gujarat / Assistant Engineer (El

Consider the following statements regarding PID Controller Design: 1. Proportional control reduces rise time. 2. Integral control eliminates steady-state error.

A 2 and 3 only

B 1 and 3 only

C **1, 2 and 3 only** Correct

D All of the above

Correct Answer: C

Full Detailed Explanation

Correct Answer: C - 1, 2 and 3 only Quick Concept Explanation Proportional action generally speeds response but leaves finite error; integral action raises low-frequency gain and can eliminate step steady-state error; derivative action adds predictive damping and can reduce overshoot. None of these by itself guarantees stability for every plant/tuning. Key relation: $u(t)=K_p e + K_i \int e\,dt + K_d de/dt$.Exam focus: I fixes offset; D improves damping; P sets overall response strength. Common trap: PID is not an unconditional stability guarantee. Statement-wise Verification Statement 1 - Correct.Proportional control reduces rise time.Proportional action generally speeds response Statement 2 - Correct.Integral control eliminates steady-state error.Integral action raises low-frequency gain and can eliminate step steady-state error Statement 3 - Correct.Derivative control improves damping.Derivative action adds predictive damping and can reduce overshoot. Statement 4 - Incorrect.PID control guarantees stability always.Controller type alone cannot guarantee stability; gains must be tuned for the plant Core Concept The P, I and D terms influence different aspects of closed-loop response. Proportional action generally speeds response but leaves finite error; integral action raises low-frequency gain and can eliminate step steady-state error; derivative action adds predictive