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| MSC ELECTRONICS ENGINEERING |
| DIGITAL CONTROL COURSEWORK1 |
| ITEC40081 |

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Q1) PID controller is a control loop technique employing feedback.it composed of three controller

1)proportional controller

2)Integral controller

3)Derivative controller

In **proportional controller,** p coefficient affects mainly to the magnitude of response showing a sudden change in error. The higher proportional gain increases the enrolment of proportional control action in the given error, it will lead to starts oscillating the control loop system and it became unstable. If the controller gain is low, it will not respond sufficiently to the disturbances.

EXAMPLE: TEMPERATURE CONTROL SYSTEM

Consider a room having temperature control system. Its main objective is maintaining the temperature in 20 degrees Celsius.it consists of heater, temperature sensor and proportional controller. If the proportional gain is low, controller response to errors will be slow, so there is a temperature difference from set point for some time. If the proportional gain is high, the controller responded quickly to any temperature difference. This will lead to heater undergoes to the continues and quick adjustments in heating temperature, that resulted in oscillations and instability in the control systems. A well-turned” p” value maintained the room temperature in close to set point with minimal oscillations and providing stable condition.

In **Integral controller**, I coefficients filter out the steady state error by assembling and correcting the past errors. The higher “I” value will reduce the steady state error in the impulse response but it can also introduce slower response and lead to instability if set too high.

EXAMPLE: WATER LEVEL CONTROL IN TANK

Imagine, we have a tank that needs to maintain a constant water level.pid controller is introduce to adjust the flow value into the tank to ensure a steady water level. Integral coefficients come to field to eliminate the steady state error in the water level.it assembling the error over time and continuously adjusts the flow value to filter out any long term derivation from desired water level. If due to disturbances, the water level fall to below the desired point, the integral term will gradually increase,

https://en.wikipedia.org/wiki/Proportional%E2%80%93integral%E2%80%93derivative\_controller