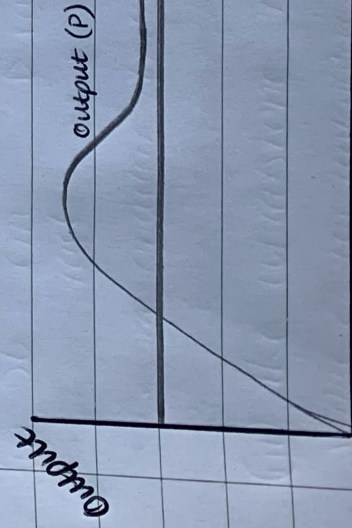


Question 2.

- a) An open loop control system has no error signal to account for differences between desired and actual outputs. Closed systems have a feedback loop and comparison element to correct for any disturbances.

Open loop provides good reliability due to simplicity but lack of automatic correction makes it highly inaccurate, with a lot of cycling around a set point. There is more complexity in a closed loop system meaning less reliable but it is a lot better and more accurate at achieving a steady state setpoint due to the inclusion of the comparison element.

- b) Proportional control is an example of a continuous control strategy, providing uninterrupted inputs and outputs to the system. Proportional control produces a control action, proportional to the error signal. For example the size of the error will dictate the output signal to the actuator. The equation for proportional control is given as $K_p \cdot e(t)$. As the diagram shows, there is still an overshoot causing steady state error but not as



error but not as

badly.

Setpoint

Combine with

Integral + derivative

for higher

accuracy.

time