

Control + Automation ExamLewis Christopher
1909572Question 1

a) A measurement is deemed as a single shot value quantity taken by the transducer, while short-term continuous readings are referred to as monitoring.

b) The two types of error in a control system are either dynamic or static. Dynamic errors are errors which occur during the working of the device, such as hysteresis, response time or settling time. Static errors are machine related faults such as non-linearity or drift.

c) The change in the length of the gauge wire will cause a proportional change in the device resistance.

iii) overall sensitivity

$$K_T = K_1 \cdot K_2 \cdot K_3 \cdot K_4$$

$$K_T = (0.75)(150 \times 10^{-3})(500)(1) \\ = 56 \text{ cm/rad.}$$

$$\frac{\Delta}{\text{rad}} \quad \frac{\Delta}{\Delta} \quad \frac{\Delta}{\text{cm}} \frac{\Delta}{\Delta}$$

ii) $56 = \frac{\text{cm}}{\text{rad}} \Rightarrow \text{rad} = \frac{8.5}{56}$

$\therefore \Rightarrow \text{angular displacement} = 0.15 \text{ rad}$

iv) The wheatstone bridge is used to determine the value of an unknown resistance, by changing it into a voltage value to be read by the recorder.