

Revised Qⁿ

DATE: ___/___/___
PAGE: ___

Q.2

Given -

Full scale reading of ammeter = $25 \text{ mA} \pm 2\%$

$$\text{error} = \pm \frac{2}{100} \times 25 = \pm 0.5 \text{ mA}$$

$$R = 820 \pm 10\% \Omega$$

we know

$$P = I^2 R$$

take both side log

$$\ln P = \ln(I^2 R)$$

$$\Rightarrow \ln P = 2 \ln I + \ln R$$

Differentiate w.r.t 'P'

$$\frac{1}{P} = \frac{2}{I} \frac{dI}{dP} + \frac{1}{R} \frac{dR}{dP}$$

$$\Rightarrow \frac{\Delta P}{P} = \frac{2 \Delta I}{I} + \frac{\Delta R}{R}$$

$$\frac{\Delta P}{P} = 2 \times (\pm 5\%) + 10\%$$

$$= 20\%$$

$$= 0.02$$

Q.4

$$i) \text{ minimum static sensitivity} = \frac{39.6 - 20}{40 - 20} \\ = 0.98$$

$$ii) \text{ Non-linearity} = \left| \frac{39.6 - 40}{100} \right| \times 100 \\ = 0.4\%$$