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① $P = \frac{\varepsilon^2}{R}$

Given; $\varepsilon = 200$ volts, $R = 8$ ohms, $d\varepsilon = 5$ volts, $\delta R = 0.20$

$P = f(\varepsilon, R)$

$> \delta P = \frac{dP}{d\varepsilon} \cdot d\varepsilon + \frac{dP}{dR} \cdot \delta R$

$> \frac{dP}{dE} = \frac{2\varepsilon}{R}, \quad \frac{dP}{dR} = -\varepsilon^2 R^{-2} = \frac{-\varepsilon^2}{R^2}$

$> \frac{dP}{dR} = \frac{-200^2}{8^2} = \frac{-40000}{64} = -625$

$> \therefore \delta P = \frac{2\varepsilon}{R} \times \delta\varepsilon + \left[\frac{-\varepsilon^2}{R^2} \times \delta R\right]$

$> \delta P = \left[\frac{2 \times 200}{8} \times (-5)\right] + \left[-625 \times 0.2\right]$

$> \delta P = [50 \times -5] + [-625 \times 0.2]$

$\therefore \delta P = -375$ volts

② $y = \frac{k w d^4}{t^3}$

$> \frac{dy}{dw} = \frac{kd^4}{t^3}, \quad \frac{dy}{\delta d} = \frac{4kwd^3}{t^3}, \quad \frac{\partial y}{dt} = \frac{-3kwd^4}{t}$

$> \delta y = \frac{dy}{\partial w} \cdot \delta w + \frac{\partial y}{\partial d} \cdot \delta d + \frac{\partial y}{\partial t} \cdot \delta t$

$$\Rightarrow \delta y = \left[\frac{Kd^4}{t^3} \times \frac{3w}{100}\right] + \left[\frac{4Kwd^3}{t^3} \times \frac{2.5}{100} d\right] + \left[\frac{-3Kwd^4}{t^4} \times \frac{4t}{100}\right]$$

$$\Rightarrow \delta y = \left[\frac{Kwd^4}{t^3} \times \frac{3}{100}\right] + \left[\frac{Kwd^4}{t^3} \times \left[\frac{4 \times 2.5}{100}\right]\right] + \left[\frac{Kwd^4}{t^3} \times \left[\frac{4 \times -3}{100}\right]\right]$$

$$\Rightarrow \delta y = \frac{Kwd^4}{t^3}\left[\frac{3}{100} + \frac{10}{100} + \frac{-12}{100}\right] \Rightarrow \delta y = \frac{Kwd^4}{t^3}\left[\frac{3}{100} + \frac{10}{100} - \frac{12}{100}\right]$$

$$\Rightarrow \delta y = \frac{Kwd^4}{t^3}\left[\frac{1}{100}\right]$$

Where $y = \frac{KWd^4}{t^3}$

$\therefore \delta y = 1\%$ OF y.