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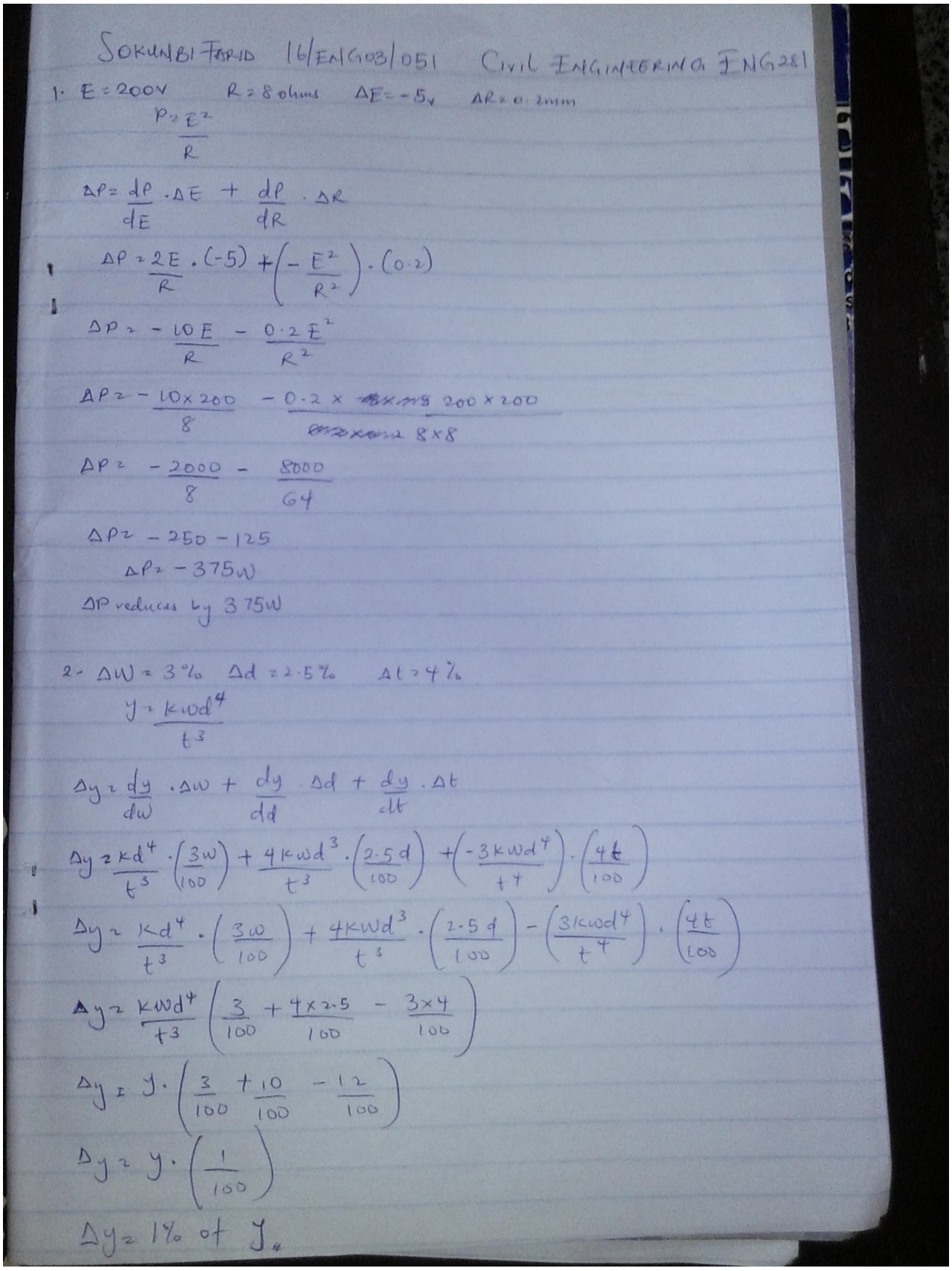
DEPT : CIVIL ENGINEERING
MATRIC NO: 16/ENG03/051



SOKUNBI FARID 16/ENG03/051 CIVIL ENGINEERING ENG281

1. $E = 200V$ $R = 8$ ohms $\Delta E = -5_V$ $\Delta R = 0.2mm$

$$P = \frac{E^2}{R}$$

$$\Delta P = \frac{dP}{dE} \cdot \Delta E + \frac{dP}{dR} \cdot \Delta R$$

$$\Delta P = \frac{2E}{R} \cdot (-5) + \left(-\frac{E^2}{R^2}\right) \cdot (0.2)$$

$$\Delta P = -\frac{10E}{R} - \frac{0.2E^2}{R^2}$$

$$\Delta P = -\frac{10 \times 200}{8} - \frac{0.2 \times 200 \times 200}{8 \times 8}$$

$$\Delta P = -\frac{2000}{8} - \frac{8000}{64}$$

$$\Delta P = -250 - 125$$

$$\Delta P = -375W$$

ΔP reduces by 375W

2- $\Delta W = 3\%$ $\Delta d = 2.5\%$ $\Delta t = 4\%$

$$y = \frac{kwd^4}{t^3}$$

$$\Delta y = \frac{dy}{dw} \cdot \Delta w + \frac{dy}{dd} \cdot \Delta d + \frac{dy}{dt} \cdot \Delta t$$

$$\Delta y = \frac{kd^4}{t^3} \cdot \left(\frac{3w}{100}\right) + \frac{4kwd^3}{t^3} \cdot \left(\frac{2.5d}{100}\right) + \left(\frac{-3kwd^4}{t^4}\right) \cdot \left(\frac{4t}{100}\right)$$

$$\Delta y = \frac{kd^4}{t^3} \cdot \left(\frac{3w}{100}\right) + \frac{4kwd^3}{t^3} \cdot \left(\frac{2.5d}{100}\right) - \left(\frac{3kwd^4}{t^4}\right) \cdot \left(\frac{4t}{100}\right)$$

$$\Delta y = \frac{kwd^4}{t^3}\left(\frac{3}{100} + \frac{4 \times 2.5}{100} - \frac{3 \times 4}{100}\right)$$

$$\Delta y = y \cdot \left(\frac{3}{100} + \frac{10}{100} - \frac{12}{100}\right)$$

$$\Delta y = y \cdot \left(\frac{1}{100}\right)$$

$\Delta y = 1\%$ of y.