$$\delta w = \frac{3w}{100}, \quad \delta d = \frac{5d}{200}, \quad \delta t = \frac{4t}{100}$$

$$\delta y = \frac{3kwd^4}{100t^3} + \frac{20wd^4k}{200t^3} - \frac{12kwd^4}{100t^3}$$

$$\delta y = \frac{1}{100}\left(\frac{3kwd^4}{t^3} + \frac{10kwd^4}{t^3} - \frac{12kwd^4}{t^3}\right)$$

$$\delta y = \frac{1}{100}\left(3y + 10y - 12y\right)$$

$$\delta y = \frac{1}{100}(y)$$

$$\delta y = 1/100\, y$$

y increases by 1/100 percent.

Abinwande Al-ameen Oluwafemi

16/ENG02/1006

Computer Engr

ENG 321

Assignment Solution

(1) $P = \frac{E^2}{R}$

$\delta E = 5V, \quad \delta R = 0.2\Omega, \quad E = 200V, \quad R = 8\Omega$

$\delta P = \frac{\partial P}{\partial E}\delta E + \frac{\partial P}{\partial R}\delta R$

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

$\therefore \delta P = \frac{2E}{R}\delta E + \left(\frac{-E^2}{R^2}\delta R\right)$

$\delta P = \frac{2(200)(-5)}{8} + \left[\frac{-200^2}{64}(0.2)\right]$

$\delta P = \frac{-2000}{8} + \left[\frac{-8000}{64}\right]$

$\delta P = -250 - 125$

$\delta P = -375$

(2) $\delta y = k\left(\frac{dy}{dw}\delta w + \frac{dy}{dd}\delta d + \frac{dy}{dt}\delta t\right)$

$\frac{dy}{dw} = \frac{d^4}{t^3}, \quad \frac{dy}{dd} = \frac{4wd^3}{t^3}, \quad \frac{dy}{dt} = \frac{3wd^4}{t^4}$