演習問題 6 解答

問題 6.1

(1) $\sigma_1 = \dfrac{13}{5} p_0$

(2) $\varepsilon_\theta = \dfrac{8p_0}{5E}\left(1-\nu^2\right)$

問題 6.2

(1) $\sigma_r = -\dfrac{7}{27} p, \quad \sigma_\theta = \dfrac{25}{27} p, \quad \tau_{r\theta} = 0$

(2) $\varepsilon_\theta = \dfrac{-7-25\nu}{27E} p$

問題 6.3

(1) $\varepsilon_r = \dfrac{P}{3E}\left\{(1-\nu)-(1+\nu)\dfrac{4R^2}{r^2}\right\}, \quad \varepsilon_\theta = \dfrac{P}{3E}\left\{(1-\nu)+(1+\nu)\dfrac{4R^2}{r^2}\right\}$

(2) $\sigma_r = \dfrac{P}{3}\left(1-\dfrac{4R^2}{r^2}\right), \quad \sigma_\theta = \dfrac{P}{3}\left(1+\dfrac{4R^2}{r^2}\right)$

(3) $\alpha = 2$