

## Answers to Selected Problems: Part II, Chapter 4

### 4.3

$$2. \quad \sigma_{rr} = -p, \quad \sigma_{\theta\theta} = -p, \quad \sigma_{zz} = -2\nu p, \quad u = -\frac{1+\nu}{E}(1-2\nu)pr$$

$$\sigma_{rr} = \frac{b^2/r^2 - b^2/a^2}{b^2/a^2 - 1} p_0 - \frac{b^2/r^2 - 1}{b^2/a^2 - 1} p_i$$

$$3. \quad \sigma_{\theta\theta} = \frac{-b^2/r^2 - b^2/a^2}{b^2/a^2 - 1} p_0 + \frac{b^2/r^2 + 1}{b^2/a^2 - 1} p_i$$

$$\sigma_{zz} = 2\nu \left[ -\frac{b^2/a^2}{b^2/a^2 - 1} p_0 + \frac{1}{b^2/a^2 - 1} p_i \right]$$

$$4. \quad u = -p \frac{1+\nu}{E} \left[ (1-2\nu) + \frac{a^2}{r^2} \right] r, \quad P = 2p(1-\nu)$$

$$\sigma_{rr} = -p \frac{1+(1-2\nu)a^2/r^2}{1+(1-2\nu)a^2/b^2}$$

$$\sigma_{\theta\theta} = -p \frac{1-(1-2\nu)a^2/r^2}{1+(1-2\nu)a^2/b^2}$$

5.

$$\sigma_{zz} = -p \frac{2\nu}{1+(1-2\nu)a^2/b^2}$$

$$u = -p \frac{1+\nu}{E} (1-2\nu) \left[ \frac{1-a^2/r^2}{1+(1-2\nu)a^2/b^2} \right] r$$

$$6. \quad u_z = -\frac{2\nu}{E} \left\{ p_i \frac{a^2}{b^2 - a^2} - p_o \frac{b^2}{b^2 - a^2} \right\} z$$