

Answers to Selected Problems: Part II, Chapter 2

2.1

- $\frac{\rho g}{E} x(L - x/2)$
 $u = x[(3.3 \times 10^{-3}) + (1.83 \times 10^{-7})(L - x)]$
- $\varepsilon = (3.3 \times 10^{-3}) + (1.83 \times 10^{-7})(L - x)$
 $\sigma = (7.0 \times 10^8) + (3.85 \times 10^4)(L - x)$

2.2

- $u(x, t) = \alpha \left(\cos \frac{\Omega}{c} x + \tan \frac{\Omega}{c} L \sin \frac{\Omega}{c} x \right) \sin \Omega t +$
 $\sum_{n=1}^{\infty} [A_n \cos(\lambda_n ct) + B_n \sin(\lambda_n ct)] \sin(\lambda_n x)$
 $\omega_n = \lambda_n c = \frac{(2n-1)\pi c}{2L}, \quad n = 1, 2, \dots$
- $u(x, t) = \frac{\alpha c}{E\Omega} \left(-\tan \frac{\Omega}{c} L \cos \frac{\Omega}{c} x + \sin \frac{\Omega}{c} x \right) \cos \Omega t +$
 $\sum_{n=1}^{\infty} [A_n \cos(\lambda_n ct) + B_n \sin(\lambda_n ct)] \cos(\lambda_n x)$
 $\omega_n = \lambda_n c = \frac{(2n-1)\pi c}{2L}, \quad n = 1, 2, \dots$