

## Answers to Selected Problems: Chapter 7

### 7.1

1.  $L/(1 + A_1L_2 / A_2L_1)$

### 7.2

1.  $\tau_{\max} = 20T / \pi d^3, \phi_B = -12LT / \pi Gd^4$

### 7.3

1. 0.25 MPa
2. (a) 15MPa, 30MPa, (b) 15MPa, (c) 750N
3. 0.13, 0.03,  $-0.07 (\times 10^{-3})$ , 0.015mm
5.  $\sigma_t / 2$

### 7.4

1.  $V = 9 - 0.75x^2$  kN,  $M = 9x - 0.25x^3$  kN m
2.  $M = -2x^2; -2x^2 + 10x - 10; -2x^2 + 10x - 2; -2x^2 + 24x - 72$  kN m
3.  $\bar{y} = 152.3$  mm
4. 107 MPa
5. 4.78 MPa;  $-0.43$  MPa
6.  $\delta_{\max} = -(5wL^4)/(384EI)$
7.  $EIv = -(Pa^3/6)(x/a)^2(3-x/a); EIv = -(Pa^3/6)(3x/a-1)$
8.  $R = wL/2; M = -wL^2/12$