16.26 (a) For a hybrid composite having all fibers aligned in the same direction

$$E_{cl} = E_m V_m + E_{f1} V_{f1} + E_{f2} V_{f2}$$

in which the subscripts $f1$ and $f2$ refer to the two types of fibers.

(b) Now we are asked to compute the longitudinal elastic modulus for a glass- and aramid-fiber hybrid composite. From Table 16.4, the elastic moduli of aramid and glass fibers are, respectively, 131 GPa (19 x 10^6 psi) and 72.5 GPa (10.5 x 10^6 psi). Thus, from the previous expression

$$E_{cl} = (4 \text{ GPa})(1.0 - 0.25 - 0.35) + (131 \text{ GPa})(0.25) + (72.5 \text{ GPa})(0.35)$$

$$= 59.7 \text{ GPa} \quad (8.67 \text{ x } 10^6 \text{ psi})$$