Problem 6.2

Ans: $E(T_0) = E(T_1) = E(T_2) = 1$

$$P(n) = P^n = \begin{cases} P^2, & n \textbf{ even} \\ P, & n \textbf{ odd} \end{cases}$$

Problem 6.3

Ans: The steady-state probabilities of states 0, 1 and 2 are $0.4,\ 0.4$ **and** 0.2 **respectively.**

Problem 9.4

Ans: $Q = \begin{bmatrix} -s & s & 0 \\ p & -(p+f) & f \\ (1-q)r & qr & -r \end{bmatrix}$

Rate balance equations:

$\pi_2(1-q)r + \pi_1 p = \pi_0 s$

$\pi_0 s + qr\pi_2 = \pi_1(p+f)$

$\pi_1 f = \pi_2[qr + (1-q)r]$

$\pi_0 + \pi_1 + \pi_2 = 1$

$\pi_0 = \frac{r[p+(1-q)f)]}{rp+rf(1-q)+rs+fs}$

$\pi_1 = \frac{rs}{rp+rf(1-q)+rs+fs}$

$\pi_2 = \frac{fs}{rp+rf(1-q)+rs+fs}$

$R = \pi_1 p = \frac{rsp}{rp+rf(1-q)+rs+fs}$