Solution to Problem 2.6

$$p_k = p_0 \prod_{i=0}^{k-1} \frac{l_i}{m_{i+1}} = p_0 \frac{r^k}{k!} \quad \text{for } k=1,2,\ldots\ldots \text{¥}$$

Using the normalization condition $\sum_{k=0}^{\infty} p_k = 1$, we get $p_0 = e^{-r}$.