5. Consider the *M/M/s* queue, with arrival rate $\lambda > 0$ and service rate $\mu > 0$.

(a) Find the condition involving $\lambda$, $\mu$, and $s$ that is necessary for there to exist a stationary distribution. Why this condition makes sense?

(b) Find the long-run proportion of time that there are $k$ customers in the system, for $k = 0,1,\ldots$