ITM529. Stochastic Processes

Short Quiz 5, 2025F, Weighting of 5%

Solution

Name: [   ]

#1. A production system has three machines working in parallel. The up times of a machine is assumed to be iid, exponentially distributed with mean 3 hours. When a machine is down, its repair times are iid, exponentially distributed with mean 1 hour. There are two repairmen, working at the same speed. Using a CTMC to find the long-run fraction of time that all machines are up and running.[5pt]

Let the state space be $\{0, 1, 2, 3\}$. Obtain $\pi = (1/43, 6/43, 18/43, 18/43)$. The long run fraction of time that all machines are up is $18/43$.

Difficulty: Easy

Amount of work: 100%