

Exercises Queueing Theory, May 5-9, 2014

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1. Jobs arrive at two parallel machines, each with its own buffer, according to a Poisson stream with a rate of 10 jobs per hour. The processing times are exponential with a mean of 4 minutes on machine 1 and 8 minutes on machine 2. On arrival jobs are assigned with equal probability to the buffer of machine 1 or 2.
  - (a) Determine the mean flow time (waiting time plus processing time) of a job sent to machine 1, sent to machine 2, and also of an arbitrary job.
  - (b) Determine the fraction of jobs with a flow time longer than 30 minutes.
  - (c) Suppose that arriving jobs are sent with probability  $p$  to machine 1 and with probability  $1 - p$  to machine 2. For which  $p$  is the mean flow time of an arbitrary job minimal?