On Four Models of a Three Server Queue with Optional Server Vacations

Authors : Kailash C. Madan

Abstract : We study four models of a three server queueing system with Bernoulli schedule optional server vacations. Customers arriving at the system one by one in a Poisson process are provided identical exponential service by three parallel servers according to a first-come, first served queue discipline. In model A, all three servers may be allowed a vacation at one time, in Model B at the most two of the three servers may be allowed a vacation at one time, in model C at the most one server is allowed a vacation, and in model D no server is allowed a vacation. We study steady the state behavior of the four models and obtain steady state probability generating functions for the queue size at a random point of time for all states of the system. In model D, a known result for a three server queueing system without server vacations is derived.

Keywords : a three server queue, Bernoulli schedule server vacations, queue size distribution at a random epoch, steady state

Conference Title : ICMSSC 2016 : International Conference on Mathematics, Statistics and Scientific Computing

Conference Location : Vancouver, Canada

Conference Dates : August 04-05, 2016