family name-name-mat.#

Traffic Theory - Questions
08/02/2017

Comment the following statements providing a detailed explanation

1 In regenerative processes the asymptotic distribution always exists

2 element q_jj of the intensity matrix Q of an MC is the rate at which the chain leaves state j.

3 In Markov Chains Pr(X_n|X_n-1, X_n+1) does not depend on X_n+1

4 The occupancy distribution in a processor-sharing system does not depend on the the service time pdf.

5 The output flow of a markovian blocking system is a Poisson flow

6 The Erlang C holds for system with any service-time pdf

7 In queueing networks, deterministic routing with closed paths allows for product-form distributions

Outline of the answers

1 FALSE. The asymptotic distribution only exists for positive recurrent regenerative processes

2 FALSE. The rate at which the chain leaves state j is - q_jj

3 FALSE. We can see this by using the Bayes formula

4 TRUE. For any service time pdf it is the one we have in M/M/1

5 FALSE. Neither the input flow nor the output flow. Unless we consider arrival flows, Poisson by definition, and the merging of the output and the blocked flows, which is still Poisson.

6 FALSE. The Erlang-C formula holds only for negative exponential service time.