

Concluding Remarks

In this work, the single server bulk service queues with state dependent service rates have been studied in detail. This is a generalization of general bulk service rule, obtained by introducing a secondary limit 'a' in the general bulk service rule. The secondary limit is chosen below the initial quorum level 'c' so that the server continue the service with a different service rate when the queue size is less than 'c' but not below the level 'a' and becomes idle when the queue size becomes less than 'a', at the service completion epoch. The limit 'a' actually decides the state of the server (idle or busy), after the commencement of batch service. A Markovian queueing model with finite and infinite capacity and a model incorporating accessibility to the service batch are considered in the study. A single and batch Markovian model under the policy (a,c,d) is also discussed in addition to other models. The steady state probability, expected queue length, expected busy period, waiting time distribution, expected waiting time, optimal value for the parameter (a, c) by considering an expected cost function with numerical examples are discussed for each model. However, the optimality problem of these queueing models and the choice of the optimal solutions for the parameters a and c are still a major area for the future study. Also the application of the model can be widened by incorporating non-Markovian process and batch arrivals to the model.

The single server bulk service queueing model under the control limit policy (a,c,d) with general bulk service rule has been analysed through analytic method in chapter 4. The vacation to the server for the model discussed in chapter 4 is studied in chapter 5. These models are analyzed by using supplementary variable techniques. The steady state probability distributions and the relationship between the queue

length distribution at various epochs have been obtained for the models. A numerical illustration is also considered for the model. In this case, the optimality problem is cited as a major area for further study. Also the decomposition property of vacation model and its analysis are the other relevant area for further investigation related to the model.
