AN \((a, b)\) POLICY DISCRETE TIME BULK SERVICE QUEUE WITH ACCESSIBLE AND NON-ACCESSIBLE BATCHES UNDER CUSTOMER’S CHOICE

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Abstract : In this article we consider a discrete time bulk service queue under the policy \((a, b)\), incorporating accessibility to the batches of ongoing service. The inter-arrival times are assumed to be independent and geometrically distributed. The customers are served by a single server under the policy \((a, b)\). Here, the server begins service only if the number of customers in the queue is at least \(a\) and serves a maximum of \(b\) customers in a batch with or without accessibility to the batches of ongoing service. If the batch size is less than \(d\) \((a \leq d \leq b)\), the arriving customer can join the ongoing service depending on the customer’s choice. That is, the arriving customer decides either to join the ongoing service (accessible batch) or waits till the next service batch starts. The service times are also assumed to be independent and geometrically distributed. The analysis of the model is considered and explicit expressions are obtained for the steady state probabilities of the system states, expected queue length and expected cost function.

Key words : Discrete Time Queues, Accessible and non-accessible batches, Steady State Distribution, Expected Queue Length, Expected Cost Function.