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VINOD KUMAR
PREFACE

The present thesis entitled “On Queuing & Scheduling linkage Problem” consists 7 chapters. Chapter-1 is an Introductory deals with historical development of Queuing & Scheduling theory and the basic fundamental concepts. It emphasises on probability distribution function related with system. We have made a thorough survey of literature regarding Queueing & Scheduling from the library of I.I.T. Roorkee, I.I.T. Delhi, University of Delhi, Kurukshetra University Kurukshetra, G.S.B.A. Greater Noida, Central library of C.C.S.University Meerut and relevant published papers & online volume of Journals at Internet.

Chapter-2 deals the analytical study of a network of queues in which a common service channel is linked in series with each of two parallel Biserial service channels. The arrivals and service pattern in the system both follow Poisson assumptions. Here we assume the service rate to be proportional to their respective queue numbers. The transient/ steady-state behaviour of the system has been studied.

Chapter-3 analyze the study of the Steady-State behaviour of a typical network of queues in which a common service channel is linked in series with each of two parallel service systems containing two sub-biserial channels. In fact the study is an extension work of chapter-2. The arrivals and service pattern in the system both follow Poisson-stream.

In Chapter-4 efforts have been made to establish a serial linkage between a network of flow-shop scheduling with a queue network in series, the output of the flow-shop system form the input for the queue-model. An algorithm is deduced based on the basic study made by Johnson & Jackson. The objective of the study is to find the minimum total waiting time of the items/ customers corresponding to the optimal
sequence of jobs/items determined in the scheduling setup.

Chapter-5 is an extension work of the study made in previous chapter. It deals with the problem of two queues in bitandem which are linked to a common channel with scheduling of jobs on two stage flow-shop setup. The objective of the study is two folds, on one hand it minimizes the total idle time of two machines and on other way, it determines the total waiting times of jobs/items for the optimal sequence of jobs/items in the given model.

Chapter-6, also deals with the linkage problems but in a reverse manner, that is this chapter establishes a linkage between a Queue-network in series with a flow-shop scheduling system. The arrivals of items/jobs of fixed size are allowed to occur at each service channel from outside infinite source population. Here the waiting time of items/jobs in queue system form the setup time for first machine in the scheduling process. The objective of the study is to find an optimal sequence of items/jobs which minimize the total flow time of machines, when items/jobs are processed in a combined system.

Chapter-7 is an attempt to study a network of queues in which a common service channel is centrally linked in series with each of two service channels containing two heterogeneous sub-service channels. The arrivals and service pattern in the system both follow Poisson-stream. The various queue characteristics like Mean Queue Size, Variance of the queue length, Average Waiting Time have been obtained. The model has many applications in globalization era of marketing, super market, industrial and complicated administrative setup.

VINOD KUMAR