A BIBLIOGRAPHY ON THE THEORY OF QUEUES

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In this bibliography an attempt has been made to assemble all papers on those aspects of the theory of probability which may be grouped together under the heading of the study of queues. In addition to purely theoretical work, the practical applications of the subject have received much attention, the most important and fruitful of these being in the field of telephone traffic. The other main applications have been to the study of road traffic, the allocation of operatives to the servicing of machines, the mathematical aspects of inventory control and production scheduling, storage problems such as the optimal size of dams and miscellaneous topics which include the scheduling of air traffic and the design of appointment systems in hospital outpatient departments. The study of point processes and, in particular, the problems arising from counts obtained from Geiger-Müller counters, resemble closely problems arising in telephone systems where no waiting is possible (loss-systems) and a selection of papers on such processes has been included. Similarly, problems arising in the theory of dams and provisioning are closely related to the problem of collective risk in actuarial studies. In the view of the large number of papers on the latter topic, some of which are specifically actuarial in character, the choice in this case has been limited to a few papers only, these being chosen both for their own intrinsic importance and for the fact that they themselves provide references to other work. A similar policy has been followed for papers concerned strictly with the economics of inventory control and also for papers on renewal theory.

Classification. The papers are listed in alphabetical order by authors and have been classified as belonging to one or more of ten main groups. These are:

C Problems dealing with storage (content).
F Problems relating to flow through a network.
G Applications not covered by the other categories.
I Inventory problems.
M Problems arising in servicing automatic machines.
P Point processes and counter problems.
Q The general theory of queues.
R Road traffic and related topics.
S Stochastic processes directly related to the study of queues.
T Problems in telephone traffic.

Within these groups, a further subdivision has been made into theory (t), numerical results (including tables and graphs) and practical applications (a), and expository and descriptive articles (d). Where it is relevant, a distinction is made between loss-systems (l) in which the customer leaves immediately if service is not available at the instant at which he first requires it and delay-systems (w) in which waiting is possible. The description of a queueing system proposed by D. G. Kendall (*Ann. Math. Statist.* (1953), **24**, 338–54) has been given where possible; in some cases the description has been omitted if the paper in question deals equally with many different systems or if the necessary information for

such a description is lacking. For simplicity, variants of the basic queue discipline (service in order of arrival) are grouped together under the letter v; such variants include queueing with priorities, random choice of the next customer to be served from amongst those awaiting service and queues in series in which the customer receives attention at more than one counter before he leaves the system.

Abstracts and short notes are indicated by the letter A and papers with useful lists of references by the letter B. Finally, the papers judged to be the most important either by reason of their contents or for their survey of a branch of the subject have been marked with an asterisk.

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