



شبكة المعلومات الجامعية

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شبكة المعلومات الجامعية



شبكة المعلومات الجامعية

التوثيق الالكتروني والميكرو فيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأفلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %



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بعض الوثائق الأصلية تالفة



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بالرسالة صفحات

لم ترد بالأصل

Suez Canal University
Faculty of Science
Mathematics Department

Queuing Models for Prioritized Packets

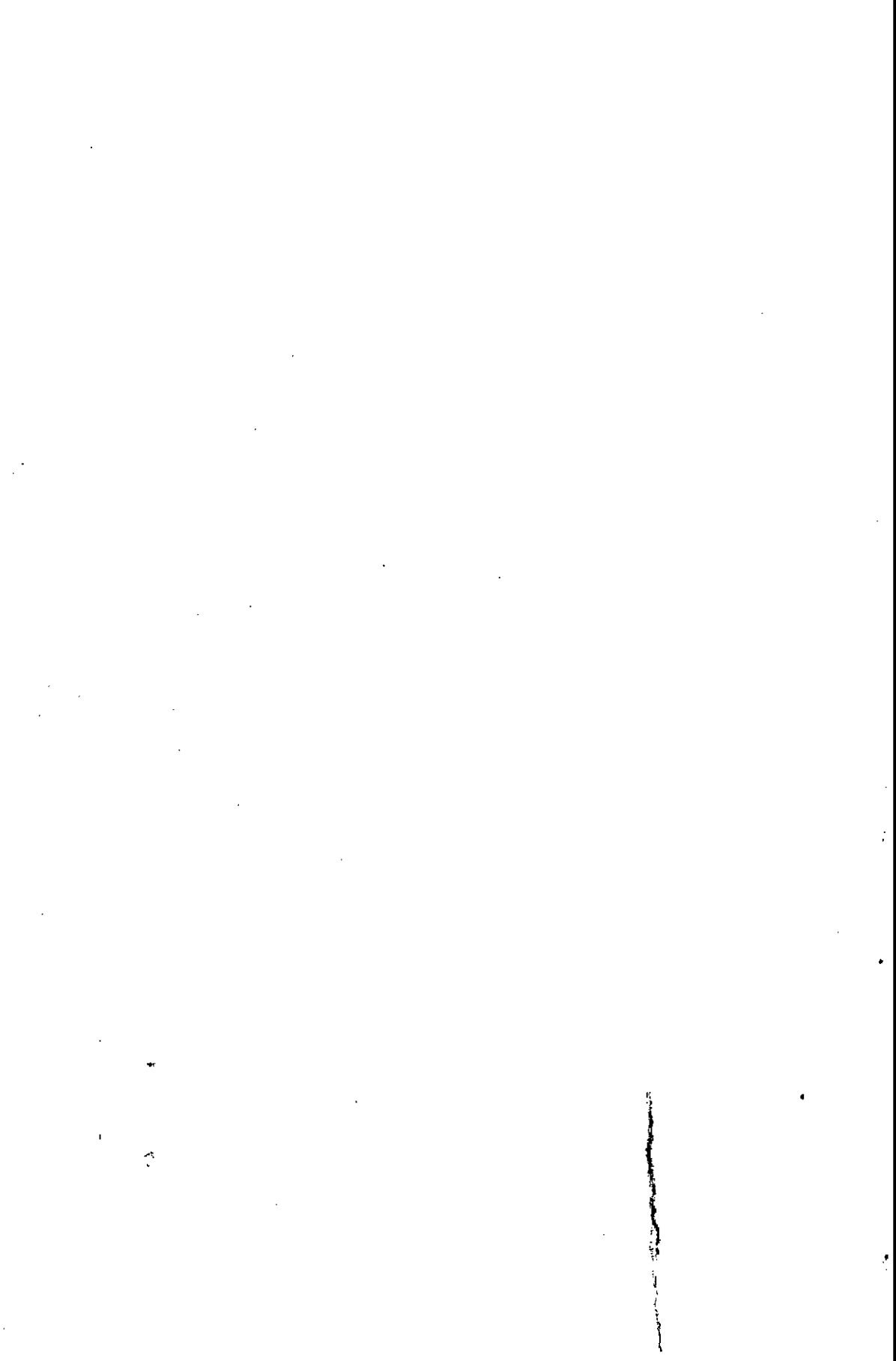
Thesis
Submitted in Partial Fulfillment
For
The Master Degree in Computer Science

To
Mathematics Department, Faculty of Science
Suez Canal University

By
Yasser Fouad Ramadan
B.Sc. Mathematics Department, Faculty of Science
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[2003]

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Queuing Models for Prioritized Packets

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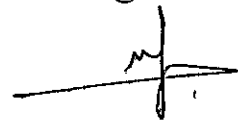
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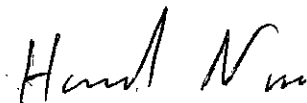
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Abstract

In modern data communications networks, one of the most important problems is to meet the quality of service (QoS) for all traffic. Real time traffic, e.g. live audio or video is delay sensitive, whereas nonreal time traffic, e.g. file transfer, is loss sensitive. One method of solving this QoS problem is the use of priority control. That is, packets are classified as either class-1, high priority, or class-2, low priority.

In this thesis, the researcher studies the buffer behavior of a fileserver in a network to meet the QoS for all traffic. In particular, he provides a discrete-time queuing model under priority control that is analyzed using queueing theory. This model is also useful for the design and the performance evaluation of many communications systems.

The assumptions of the model have been made so general that many previous models can be considered special cases of it.

In this model, the researcher assumes that the arrival process is deterministic of one batch. That is, in each slot a batch containing packets of only class-1 or only class-2 arrives. The batch size is assumed to be random. The service time has geometric distribution and the buffer size is infinite. The priority control is nonpreemptive and the approach of analysis is a random variable.

The results of the analysis include deriving the PGF of system occupancy and the marginal PGFs of the number of class-1

and class-2 packets. The joint PGF of the unfinished work and the marginal PGF of the unfinished work for class-1 and class-2 are also derived. Waiting time for class-1 and class-2 packets are obtained. The relation between the preemptive and nonpreemptive priority control will be identified. Most of the results will be verified using previous work.

The researcher presents some numerical results in order to show the computational feasibility of the analytical results. The important results of this thesis are as follows.

1. From the point view of class-2 packets, the nonpreemptive priority control is a better discipline than the preemptive priority control.
2. The expected number of class-1 packets in a nonpreemptive system is higher than that in an equivalent preemptive system.
3. By contrast, the expected number of class-2 packets in a nonpreemptive system is less than that in an equivalent preemptive system.
4. The waiting time and buffer occupancy for both classes in nonpreemptive and preemptive disciplines are the same when the service time of each packet is deterministically one slot (as is the case in the asynchronous transfer mode (ATM) environment).
5. The expected class-2 waiting time depends on both the arrival rate of class-1 packets and the service rate of the system as whole.