MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Electrical Engineering and Computer Science
Department of Aeronautics and Astronautics

Fall 2002

6.263/16.37
Problem Set No. 7

Reading: Sections 5.1 – 5.3

Problem #1:
Consider an input queued switch with first-come-first-serve service discipline
and suppose that instead of queueing packets at the input until they can be
served, packets at the head of the queue that are not selected for service are
immediately dropped and replaced with new packets. This has the effect of
"randomizing" the HOL inputs such that they are all independent of each other.
Assume that the destinations of the packets are uniformly distributed, and
compute the maximum throughput of the switch. Show that as N-> infinity, the
throughput approaches 1-1/e ~= 0.632.
(Hint, compute the probability that an output port is busy).

Text Problems: 5.1, 5.2, 5.4, 5.5, 5.18