Hadassah Academic College
Department of Computer Science

Protocols and Computer Networks Exercise 1

1. The output of a statistical multiplexor is connected to a cable operating at 100 Gbps. Each of the input lines operates at 2 Gbps.
   a. If each input line runs at 100% capacity, what is the maximum number of input line that can be serviced by the multiplexor?
   b. If the average utilization on each line is 80% of capacity, what is the maximum number of input line that can be serviced by the multiplexor?
   c. The multiplexor is equipped with a 180 MByte buffer. How long can this system, designed for 80% capacity, operate at 100% capacity before the buffer will overflow?
2. A transmission line carries VBR traffic at an average rate of 10 Gbps. To insure that the traffic is less than the full capacity of the receiver 99% of the time, what capacity must the receiver provide (to a reasonable approximation). Hint: take a time period of $T = 10^{-9}$ seconds as the basis of the calculation.