Chapter 7: Hints & Answers

7.6 (a) Around 100 Mbits/hour; (b) 10-100 Mbits/hour

7.11 k = 3, oversubscription ratio = 50/3.

7.12 oversubscription ratio = 1000/122

7.17 For 10 ms packetization, the 1.5 Mbps and 45 Mbps backbones give nearly the same total delay, 22 ms and 20 ms respectively. For 100 ms packetization, the 1.5 Mbps backbone has a significantly larger delay than the 45 Mbps backbone, 35 ms and 22 ms respectively.

7.19

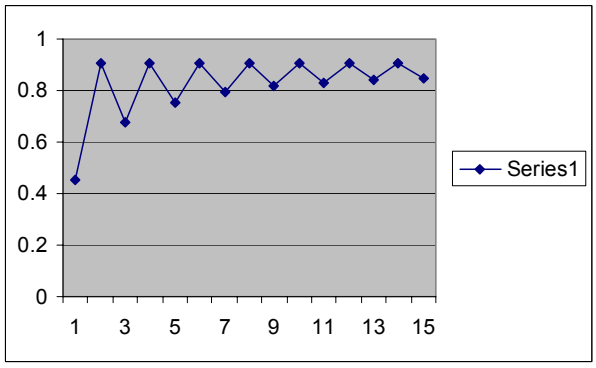
$$\alpha = \frac{8\sqrt{6} - 48 + \lambda_T}{\left(1+\sqrt{6}\right)\lambda_T} = \frac{\lambda_T - 28.4}{3.45\lambda_T}$$ where α must be zero for arrival rates less that 28.4.

7.20 (c) $k = \sqrt{\frac{mh}{L-1}}$

7.22 You will find an expression which requires that the VC setup time is small and where the difference between the datagram and VC headers is large.

7.31 (a) Maximum flow is 3R. (b) Maximum flow = 8R/3.

7.35



7.36 You will obtain two graphs that show there is a tradeoff between efficiency and packetization delay. The efficiency improves as P is increased; however the packetization delay also increases with P. An overly stringent delay requirement can lead to bandwidth inefficiency.

7.41 (c) 2197 cells

7.43 (c) Assume on periods have parameter $\alpha > 1$ and that off periods have parameter $\beta > 1$. What happens when either or both of these parameters become less than 1?

7.51 First plot how the packet arrivals are served in a fluid flow system. Next plot round number versus time. Finally plot how the packet arrivals are served in the real system.

7.54 Draw a table in which each row corresponds to one of the buffers and each column corresponds to a round. The entries in the matrix give the state of the buffer and indicate when a buffered is served.

7.57 4 cells are non-conforming in the first case; 5 cells are non-conforming in the second.