Model Question Paper

Second Semester M. Tech Degree Examination in
Electronics and Communication Engineering
Stream: Telecommunication Engineering (2013 Scheme)
`TTD 2004: High Performance Communication Networks

Time : 3 hours Max. Marks : 60

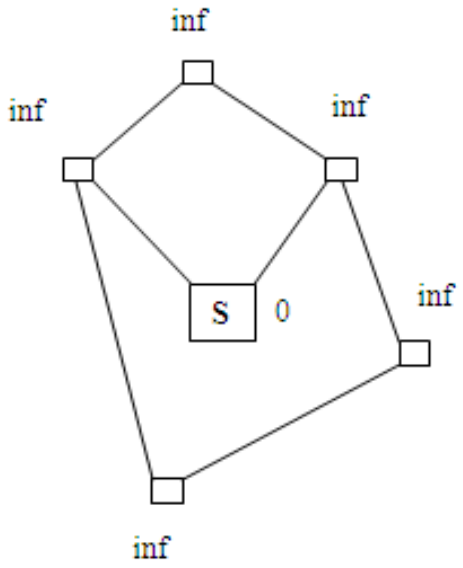
Instructions: *Answer any 2 questions from each module (Each Carries 10 Marks)*

Module I

1) Explain layered architecture of network functions and implementation of layers. (10)
2) Consider a 10,000-km round-trip route with a transmission rate of 100Mbps.Suppose a propagation time of 5μs/km.Consider a packet size of 1000 bits. How many packets are needed to fill up the links along the route? What is the minimum window size in the Go Back N protocol to achieve 100% efficiency? (10)
3) The analog phone access line has a bandwidth of 4 kHz. The line can be used to transmit digital voice at 64Kbps or using a modem, to transmit data at 9.6 or 11.4 Kbps.What is the spectral efficiency in each case? What kind modulation scheme would you use to increase spectral efficiency? (10)

Module II

4) Explain multiplexing, STS hierarchy showing the backward and forward compatibility and demultiplexing on SONET with the help of suitable diagrams. (10)
5) (a) Draw a 'SONET frame'. Calculate STS-1 rate if one frame duration is 125μs. (6)
   (b) Explain the concept of 'Window adjustment in TCP'. (4)
6) Indicate the successive steps of the OSPF (Dijkstra) algorithm to find the shortest paths from the source S to all the other nodes. All the links wavelengths are 1for each step, label the nodes, mark the nodes that should be marked, and select the appropriate links. Break ties by exploring nodes with same smallest label in the order from left to right and from top to bottom.



(10)

Module III

7) Consider a path loss model $P_R/P_T = d_0/d$.Given d_0=100 meters is a propagation constant is the propagation distance, and α is the path loss exponent. If $P_{T=}$100 mW and P_R=1mWrequired for acceptable performance, what is the maximum transmission range of our system for a path loss exponent α=2? By how much would the transmission range decrease if the path loss exponent was α=4? (10)

8) (a)Analyze the buffers saved in output buffer compared with distributed buffer, and shared buffer compared with output buffer. (6)

   (b)Write the definition of NWC and SWA numbers. Show that for an acyclic network the two numbers are the same. (4)

9) A packetization delay depends on the speed of the information transfer. Calculate the packetization delay for:

   (a) 53-byte ATM cells

   (b) A 1000 byte packet transfer service for: (1) voice samples that are sampled 8000 times per second and encoded into a 64-Kbps stream and (2) MPEG-1,which takes 30 video frames per second and encodes them into a 1-Mbps stream. (10)