



AUTUMN END SEMESTER EXAMINATION-2015

9th Semester B.Tech Dual Degree

ADVANCE COMPUTER NETWORKS (PGIS-103)

(Regular-2011 & Back of Previous Admitted Batches)

Full Marks: 60

Time: 3 Hours

Answer any SIX questions including Question No.1 which is compulsory.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

1. Answer all the questions. [2 × 10]
- i) Why every IPv6 node must join Solicited node multicast address? Explain.
 - ii) Explain the use of Anycast address in IPv6.
 - iii) State the different scenario when the RESET control message gets transmitted in TCP/IP.
 - iv) In TCP, how many sequence numbers are consumed by each of the following segments?
 - SYN
 - ACK carrying no data
 - v) Why error control is done at both transport as well as data link layer?
 - vi) Explain, why TCP sets a random Initial Sequence Number rather than setting it to 1.
 - vii) Explain the necessity of SACK header in TCP with example.

- viii) How does TCP handles the idle connection?
- ix) Explain, why pseudo-header is a part of TCP checksum calculation.
- x) Why BGP uses TCP rather than UDP as its transport-layer protocol?
2. a) Explain simultaneous open operation in TCP and illustrate the messages exchanged along with the state changes. [4]
- b) Two hosts A and B are communicating with each other using TCP. Assume the sequence number field starts at 0 and the receiver employs cumulative ack. A has successfully sent 465 bytes of data which were also acked by B. Suppose A is now ready to send 3 segments of size 100, 40 and 60 each. [4]
- (i) What sequence number will the third segment carry and why?
- (ii) Suppose the second segment was received before the first and third segment, then what will be the ack value when the ack generated as a consequence of receiving this second segment?
3. a) What do you mean by congestion control? Explain the steps involved in TCP to avoid congestion control. [4]
- b) In TCP, at what circumstances half-open connection established? Explain this through suitable example. [4]
4. a) Explain the importance of BGP protocol in TCP/IP stack. Discuss how BGP protocol works. [4]
- b) In TCP state transition, explain various state changes that occurred during the receive of RST control message. [4]

5. a) How the MAC-based link local address of an IPv6 node is constructed? Explain with an Example. [4]
b) Explain, the necessity of hierarchical routing and how does the OSPF protocol handles this hierarchical topology. [4]
6. a) Discuss MAC protocols used in Gigabit Ethernet w.r.to half duplex and full duplex mode. [4]
b) Discuss how the encapsulation and decapsulation of packet is done in TCP/IP stack while sending the data from a sender to a receiver. Also explain how demultiplexing helps in delivering the packet to the appropriate protocol running in the upper-layer at the receiver end. [4]
7. a) What is the necessity of adjustment of sliding window during the packet transmission even if the sliding window size is set during the connection establishment? What are the different informations need to be communicated as well as the pointer movements during the adjustment of sliding window? [4]
b) Discuss the different factors involved in deciding the packet size for the better performance in data transmission. Based on the various factors, analyze the packet size optimization. [4]
8. Write short notes on followings. [2 × 4]
i. Retransmission Timeout Timer
ii. Count to infinity problem in RIP
iii. Neighbor unreachable in IPv6
iv. various switching techniques inside a router

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