GANPAT UNIVERSITY

M. Tech Semester – II, Computer Engineering
Regular Examination – April - June 2015
3CE205: Satellite Networking (Elective II)

Time: 3 Hours]   **[Total Marks: 60]**

Instructions:
1. Attempt all questions.
2. Figures to the right indicate full marks
3. Each section should be written in a separate answer book

SECTION-I

Q-1. (A) Define uplink and downlink with reference to the satcom system. How it affect the performance of transport layer protocol? Calculate transmission time for ATM cell on 6 Mbps link.   [5]

(B) Differentiate GEO, MEO and LEO.   [4]

(C) Differentiate application and services.   [1]

OR

Q-1. (A) Consider the chain topology: A ---- B ------ C ---- D ---- E ---- F   [5]

A is sending packets to F using a reliable transport protocol. Each link above can transmit two packets per second. There are no queues or other sources of delays at the nodes (except the transmission delay of course).

    i. What is the RTT between A and F?
    ii. What is the throughput of a stop-and-wait protocol at A in the absence of any losses at the nodes?
    iii. If A decides to run a sliding window protocol, what is the optimum window size it must use? What is the throughput achieved when using this optimum window size?

(B) Describe ATM in brief.   [4]

(C) Define BER and PER.   [1]

Q-2. (A) Differentiate TCP & UDP. Explain the TCP header. If we use default window size then calculate the maximum throughput possible on 600 RTT link of 1 Gbps.   [4]

(B) Explain the differences between satellites with transparent and onboard switching techniques.   [4]

(C) Describe a multiple access mechanism in brief.   [2]

OR

Q-2. (A) Differentiate Synchronous & Asynchronous transfer mode.   [3]

(B) Explain the concept of IP over satellite   [4]

(C) Discuss the performance of UDP and TCP with respect to different values of RTT. Assume other network parameters are same.   [3]

Q-3. (A) Suppose the distance between satellite earth station & earth receiver through GEO satellite is 36000 kms. Calculate the total time required to successfully transmit an ATM cell on 1000 Mbps link. Assume that ACK indicates the successful transmission of the segment.   [4]

(B) What do you mean by burst error? Discuss the impact of satellite burst errors on the ATM layer.   [3]

(C) Describe advantages and disadvantages of satellite communication.   [3]

Q-4. (A) What are TCP variations? Explain slow start and congestion avoidance phase of TCP. [4]

(B) Describe the concept of bottleneck link. How BDP of the link will affect the performance of transport layer protocol. [4]

(C) A system uses the "stop – and – wait" ARQ protocol. If each packet carries 1000 bits of data, how long does it take to send 1 million bits of data if the distance between the sender and receiver is 8000 km and the propagation speed is $2*10^8$ m? Ignore transmission, waiting, and processing delays. We assume no data or control frame is lost or damaged. [2]

OR

Q-4. (A) Differentiate Reno & New Reno in brief. Discuss the performance of both the flavor in presence of multiple losses. [5]

(B) Differentiate the proactive and reactive approach of congestion detection mechanism. Describe TCP vegas in brief. [5]

Q-5. (A) At time t, a TCP connection has a congestion window of 6000 bytes. The maximum segment size used by the connection is 1000 bytes. What is the congestion window after it sends out 4 packets and receives acks for all of them? Suppose there is one ack per packet. [4]

    a. If the connection is in slow-start?

    b. If the connection is in congestion avoidance phase?

(B) Discuss the concept of SACK. Explain the performance of TCP with SACK & without SACK. [4]

(C) Describe the issue of receiver reneging. [2]

OR

Q-5. (A) What is the need to design the TCP westwood? Explain TCP westwood in brief. [4]

(B) Describe the mechanism of large initial window, path MTU discovery and window scaling mechanism to enhance the performance of TCP. [4]

(C) Explain the modifications required in TCP/IP model in context of satellite networking. [2]

Q-6. (A) Differentiate end-to-end and non end-to-end solution of TCP enhancements. Explain TCP PEP in brief. [4]

(B) Define friendliness and fairness issues at transport layer. [2]

(C) Suppose TCP sender wants to detect the reason for the segment loss. The loss of the segment can be due to the congestion or link error. Suggest a mechanism or an approach to detect the reason for the loss of the segment. [2]

(D) Describe TCP hybla in brief. [2]

END OF PAPER