Exam No._____

GANPAT UNIVERSITY

M. TECH. SEM: II COMPUTER ENGINEERING/INFORMATION TECHNOLOGY
CBCS REGULAR EXAMINATION APRIL-JUNE 2017
3CE208/3IT208 : SATELLITE NETWORKS

TIME: 3 HRS   **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.
4. Assume necessary data when needed.

SECTION - I

Q.1	(A)	Explain the concept of satcom system. What is satellite footprint?	(4)
	(B)	List out and differentiate the various orbits defined for satellite communication.	(4)
	(C)	Discuss the reason for the selection of satellite uplink and downlink frequencies.	(2)

OR

Q.1	(A)	Describe DVB over Satellite.	(4)
	(B)	Explain advantages and disadvantages of satellite communication.	(4)
	(C)	Differentiate between multiplexing and multiple access.	(2)

Q.2	(A)	Explain ATM cell header format for UNI.	(4)
	(B)	Explain following equation and each term of equation.	(4)

$$D = t_t + t_{up} + t_i + t_{down} + t_s + t_q$$

Calculate t_t to transmit an ATM cell at 6 Mbit/s link.

	(C)	Write functionalities of ATM adaptation layer.	(2)

OR

Q.2	(A)	Explain ATM switching operations.	(4)
	(B)	What is burst error? Describe the impact of satellite burst errors on the ATM layer.	(4)
	(C)	Briefly explain asynchronous TDM.	(2)

Q.3	(A)	Differentiate between transparent transponders and on-board processing transponders.	(4)
	(B)	Suppose there is a 10 Mbps microwave link between a geostationary satellite and its base station on Earth. Every minute the satellite takes a digital photo and sends it to the base station. Assume a propagation speed of $2.4 * 10^8$ meters/sec. Find propagation delay and bandwidth delay product of the link.	(3)
	(C)	Explain the concept of IP over Satellite.	(3)

SECTION - II

Q.4 **(A)** Describe following TCP enhancements. **(4)**
(1) Path MTU Discovery (2) Window Scaling

(B) Explain the concept of SACK. **(3)**

(C) Calculate the latency (total delay from first bit sent to last bit received) for the following scenario. **(3)**

Sender and receiver are separated by two 1-Gigabit/s links and a single switch. The packet size is 5000 bits, and each link introduces a propagation delay of 10 microseconds. Assume that the switch begins forwarding immediately after it has received the last bit of the packet and the queues are empty.

OR

Q.4 **(A)** Describe following TCP enhancements. **(4)**
(1) Large Initial Window (2) Byte counting

(B) Differentiate TCP New Reno and Reno. **(3)**

(C) Consider two nodes, A and B. Suppose the network path from A to B has a bandwidth of 5 KB/s and a propagation time of 120 msec. The path in the reverse direction, from B to A, has a bandwidth of 10 KB/s and a propagation time of 80 msec. Let data packets have a size (including all headers) of 500 bytes and acknowledgment packets a size of 100 bytes. Give a numeric expression for the throughput A can achieve in transmitting to B using Stop-and-Wait. You can treat a 500-byte data packet as transferring 500 bytes of useful data. **(3)**

Q.5 **(A)** Explain how satellite link affect the performance of TCP in detail. **(5)**

(B) Describe the approach of TCP Hybla. What are the performance issues with TCP Hybla? **(5)**

OR

Q.5 **(A)** Describe the working of TCP Vegas. **(5)**

(B) Explain Westwood in brief. Discuss the performance of Westwood and Reno in presence of PER. **(5)**

Q.6 **(A)** Describe a transport layer enhancement for satellite network which doesn't maintain the end to end semantic. What is difference between TCP spoofing and TCP splitting? **(6)**

(B) Over many months, you and your friends have painstakingly collected a 1,000 Gigabytes worth of movies on computers in your dorm. To avoid losing it, you'd like to back the data up on to a computer belonging to one of your friends in New York. You have two options: **(4)**

(1) Send the data over the Internet to the computer in New York. The data rate for transmitting information across the Internet from your dorm to New York is 1 Megabyte per second.

(2) Copy the data over to a set of disks, which you can do at 100 Megabytes per second. Then rely on the US Postal Service to send the disks by mail, which takes 7 days.

Which of these two options is faster? And by how much?

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