Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

End Semester Examination Synoptic/Breakup

Nov 2017

Max.Marks: 100 Duration: 3Hrs

Class: B.E. Semester: VII

Course Code: EXC704 Branch: ETRX

Name of the Course: Computer Communication and Networks

Instruction:

(1) All questions are compulsory

(2) Draw neat diagrams wherever required

(3) Assume suitable data if necessary

(3) CO – Course Outcomes

Q.1 (a)	Multiplexing -(01 Mark); comparison of TDM AND FDM. (04 Marks)
Q.1 (b)	For five channels, we need at least four guard bands. This means that the required bandwidth is at least 5 x 100 + 4 x 10 = 540 kHz (05 Marks) Synchronous Transmission: With Synchronous Transmission all the letters or data in one group of data is transmitted at one time as a block of data called a frame or packet. The start and end of each packet sometimes is marked by adding synchronization characters (SYN) at the start/end of each packet.(02Marks) Problem of transparency. (04Marks) Two error detection mechanisms (04Marks) OR
Q.1 (b)	data link layer protocols for noiseless (error-free) channels: 1) Simple Protocol 2) Stop and Wait Protocol (05 Marks) noisy (error-creating) channels: 1) Stop-and-Wait ARQ 2) Go-Hack-N ARQ 3) Selective Repeat ARQ -(any two) (05 Marks)
Q.2 (a)	NAT: A technology that allows a private network to use a set of private addresses for internal communication and a set of global Internet addresses for external communication (02 Marks) STUN protocol explaination and drawbacks (08 Marks).
Q.2 (b)	1)C = B log2 (1 + SNR) = 3000 log2 (l 3162) = 3000 log2 3163 =34,860 bps This means that the highest bit rate for a telephone line is 34.860 kbps. If we want to send data faster than this, we can either increase the bandwidth of the line or improve the SNR.(2.5 Marks) 2) C = B log2 (1 + SNR) = B 10g z (l + 0) = B log2 1 = B x 0 = 0 (2.5 Marks). This means that the capacity of this channel is zero regardless of the bandwidth. In other words, we cannot receive any data through this channel (2.5 Marks). OR

Q.2 (b)	a)The data rate of each source is 250 x 8 = 2000 bps = 2 kbps. b) Each source sends 250 characters per second; therefore, the duration of a character is 1/250 s, or4 ms c.) Each frame has one character from each source, which means the link needs to send 250 frames per second to keep the transmission rate of each source. d.) The duration of each frame is 11250 s, or 4 ms. Note that the duration of each frame is the same as the duration of each character coming from each source. e.) Each frame carries 4 characters and I extra synchronizing bit. This means that each frame is 4 x 8 + 1 = 33 bits.
Q.2 (c)	LEO, MEO and GEO comparison (05 Marks). Height of the orbit = 22,300 mile;That is 36,000km = $3.6 * 10^7 m$ $orbital\ radius = 3.6 * 10^7 m + 6.38 * 10^6 m = 4.2 * 10^7 m$ $Now\ T = 2\pi\sqrt{r^3/4 * 10^{14}}$ $T = 86,000 sec(rounded) = 86,000 sec = 1,433 min = 24 hours(rounded)(05 Marks)$
	OR
Q.2 (c)	ALOHA (01 Mark); Pure and Slotted ALOHA comparison (04 Marks). The frame transmission time is 200/200 kbps or 1 ms. a. If the system creates 1000 frames per second, this is 1 frame per millisecond. The load is 1. In this case S = G x e- 2G or S = 0.135 (13.5 percent). This means that the throughput is 1000 X 0.135 = 135 frames. Only 135 frames out of 1000 will probably survive. b. If the system creates 500 frames per second, this is (1/2) frame per millisecond. The load is (112). In this case S = G x e- 2G or S = 0.184 (18.4 percent). This means that the throughput is 500 x 0.184 = 92 and that only 92 frames out of 500 will probably survive.(05 Marks)
Q.3 (a)	Error control and Flow control (02 Marks) Compare and contrast byte-stuffing and bit-stuffing. (03 Marks)
Q.3 (b)	Hidden Node Problem: In the case of wireless network it is possible that A is sending a message to B. But C is out of its range and hence while "listening" on the network it will find the network to be free and might try to send packets to B at the same time as A. So, there will be a collision at B. The problem can be looked upon as if A and C are hidden from each other. Hence it is called the "hidden node problem". Exposed Node Problem: If C is transmitting a message to D and B wants to transmit a message to A, B will find the network to be busy as B hears C transmitting. Even if B would have transmitted to A, it would not have been a problem at A or D. CSMA/CD would not allow it to transmit message to A, while the two transmissions could have gone in parallel. (2.5 Marks each)
Q.3 (c)	Factors that Cause Congestion:1) Packet arrival rate exceeds the outgoing link capacity. 2)Insufficient memory to store arriving packets 3) Bursty traffic 4) Slow processor (01 Marks) Congestion Control is concerned with efficiently using a network at high load. Several techniques can be employed. These include: Warning bit; Choke packets; Load shedding; Random early discard; Traffic shaping; The first 3 deal with congestion detection and recovery. The last 2 deal with congestion avoidance.(09 Marks for detail explanation of Warning bit,piggybacking and choke packets)
	OR

Q.3 (c)	QoS (01 Marks) Define the flow characteristics for QoS—Reliability;delay;jitter; bandwidth (04 Marks). Also discuss any 2 scheduling techniques used for QoS improvements — FIFO; Weighted scheduling; priority queuing (05 Marks).
Q.4 (a)	Draw and explain frame format of IEEE802.3. (05 Marks) **OR**
Q.4 (a)	Draw and explain frame format of PPP.(05 Marks)
Q.4 (b)	Discuss Max-Min fairness algorithm with example. (05 Marks)
Q.4 (c)	Subnet Mask Works example (02 Marks) IP Address :192.168.1.1 Subnet Mask : 255.255.255.0 ANDING PROCESS : 192.168.1.1 = 11000000.10101000.00000001.00000001 255.255.255.0 = 11111111.11111111.11111111.00000000 ========== 192.168.1.0 = 11000000.10101000.00000001.00000000 Class C : N.N.N.H (08 Marks) 110xxxxx.xxxxxxxx.xxxxxxxx.xxxxxxxx Class C : 192.168.1.0 No. of Subnets: 2; No. of hosts: 62/subnets. if you convert 2 host bits to network bits, then customize subnet masks is 255.255.255.192 subnet range: 192.168.1.64 - 192.168.1.191
Q.5 (a)	Three major components explanation with diagram of relevant example: user agents (02 Marks) mail servers (03 Marks) simple mail transfer protocol: SMTP.(05 Marks) **OR**
Q.5 (a) Q.5 (b)	What are cookies and cache? (04 Marks). DNS explanation.(06 Marks) Comparison of Connection Oriented and Connectionless protocols(02 Marks). Working of FTP (03 Marks)
Q.5 (c)	Compare Leaky Bucket algorithm with Token Bucket algorithm.: LB discards packets; TB does not. TB discards tokens. With TB, a packet can only be transmitted if there are enough tokens to cover its length in bytes. LB sends packets at an average rate. TB allows for large bursts to be sent faster by speeding up the output. TB allows saving up tokens (permissions) to send large bursts. LB does not allow saving.

————-Best of Luck————