School of Computer Science Engineering and Information Systems
Fall Semester 2023-2024
Continuous Assessment Test – II

Programme Name & Branch: MCA
Course Name & code   : Data Communication and Networking (PMCA505L)
Class Numbers(s)   : VL2023240106191, VL2023240106192, VL2023240106195
Faculty Name (s)   : Prof. ArivuSelvan K, Prof. Asis Kumar Tripathy & Prof. Ushapreethi P
Exam Duration   : 90 Min.   Maximum Marks: 50

Answer all the Questions:

Q.No	Question	Max Marks
1.	a. Hosts A and B are connected to each other via router R. The bandwidth from A to R is 10Mbps, and the bandwidth from R to B is 5Mbps. Assume host A sends a 30KB file to host B. Assume the file is divided into two packets, p1 and p2, where p1 has a length of 10KB, and assume the packets are sent back-to-back. i) What is the difference between the transmission times of the first and the second packet at host B? ii) What is the propagation time if the distance between the A and B is 16,000 km? Assume the propagation speed to be 2.4×10^3 ms. b) A digital signal has eight levels and sends the data 101 110100001010000 in 1 second; Draw the digital signal as graph with respect to time and amplitude.	5 5
2.	a. Five channels, each with a 200-kHz bandwidth, are to be multiplexed together. Show the configuration, using the frequency domain and identify the minimum bandwidth of the link if there is a guard band of 5 kHz between the channels to prevent interference? b. Draw the Direct Sequence Spread Spectrum for the following data with 4-bit spread code 1101. Data : 10101101101	5 5
3.	Consider the following parameters for a switching network: N= number of hops between two given end systems L= message length in bits B= data rate in bits per second (bps), on all links P= packet size H= overhead (header) bits per packet S= call setup time (circuit switching or virtual circuit) in seconds D= propagation delay per hop in seconds For N=5, L=6400, B=50000, P=2048, H=16, S=0.3, D=0.004, compute the end-to-end delay for circuit, virtual-circuit, and packet switching. Assume there are no acknowledgements, and no queuing delay.	10

		10
4.	A multiplexer combines three 200-kbps channels using a time slot of 3 bits. a) Show the output with three arbitrary inputs. b) What is the frame rate? c) What is the frame duration? d) What is the bit rate? e) What is the bit duration?	
5.	a. Consider the Virtual circuit with three switches S1, S2, S3 with VCI values 22, 36, 67 and two end systems A,B with VCI values 34,81 respectively. i) Draw the virtual circuit with request frame and table entry for setup request from A to B via the switches s2, s1, s3. ii) Draw the virtual circuit with acknowledgement frame and table entry for acknowledgement from B to A for the request given in question i. b. i) Calculate the 4 bits-checksum of the following message. 10101111010100001010	6
	ii) A 2B/3B block coding follows parity check with 2^k data words and 2^n code words, Consider k = 2, n = 3 ; find valid and invalid code words.	4

****************All the best**************