

## FIFTH SEMESTER B.Tech. (CSE) MAKE UP SEMESTER EXAMINATION

## SUBJECT: Data Communication (Programme Elective) – (CSE 4025)

Time: 3 hours

## Date: 27-12-2019

Max Marks: 50

**NOTE:** DO NOT SEEK ANY CLARIFICATIONS FROM THE INVIGILATOR. MISSING DATA MAY BE ASSUMED SUITABLY.

Answer all the questions

1 a)	What is a data flow? Explain its various categories with suitable illustrations?					
1 b)	What is the significance of mesh topology? Explain its advantages and disadvantages.					
1 c)	Compare and contrast analog and digital signals with suitable diagrams?	3 M				
2 a)	<ul> <li>i) A non-periodic composite signal has a bandwidth of 200 kHz, with a middle frequency of 140 kHz and peak amplitude of 20 V. The two extreme frequencies have an amplitude of 0 v. Draw the frequency domain of the signal.</li> <li>ii) Define signal to noise ratio with suitable schematic examples of large and small SNR.</li> </ul>	4 M				
2 b)	Define propagation and transmission time? What are the propagation time and the transmission	3 M				
	time for a 5-Mbyte message (an image) if the bandwidth of the network is 1 Mbps? Assume					
	that the distance between the sender and the receiver is 12,000 km and that light travels at 2.4 $ imes$					
	$10^8$ m/s.					
2 c)	What is baseline wandering? What are the implications of long runs of fixed amplitude?	3 M				
3 a)	Compute NRZ, AMI, B8ZS and HDB3 line coding for the binary sequence 1010000110000000010.	4 M				
3 b)	<ul> <li>Draw the constellation diagrams for the following:</li> <li>i. ASK with a peak amplitude values of 1 and 3</li> <li>ii. BPSK with a peak amplitude value of 2</li> <li>iii. OPSK, with a peak amplitude value of 3</li> </ul>	4 M				
3 c)	<ul> <li>iv. 8-QAM with two different peak amplitude values, 1 and 3, and four different phases.</li> <li>The telephone line has 4 KHz bandwidth. What is the maximum number of bits we can send using each of the following techniques? Assume d = 0.</li> <li>i. ASK ii. QPSK</li> </ul>	2 M				

- 4 a) Four channels are multiplexed using TDM. If each channel sends 100 bytes/s and we multiplex 5 M 1 byte per channel, show the frame traveling on the link with a neat diagram, the size of the frame, the duration of a frame, the frame rate, and the bit rate for the link.
- 4 b) Discuss the different kinds of propagation modes for unguided signals with a neat diagram. 3 M
- 4 c) Find the output port and the output VCI for packets with the following input port and input VCI 2 M addresses with respect to switch (router) in a virtual-circuit network shown in Fig.4c.1.
  i) Packet 1: 3, 78 ii) Packet 2: 2, 92 iii) Packet 3: 4, 56 iv) Packet 4: 2, 71

Incoming		Outgoing					7.			
Port	VCI	Port	VCI							
1	14	3	22	1		X				
2	71	4	41	1			4			
2	92	1	45				I 1			
3	58	2	43			2				
3	78	2	70		2	3				
4	56	3	11							
Fig 4c.1										

- 5 a) Explain the different topologies that create a logical ring in a token passing network.
  4 M
  5 b) Explain in detail the transition phases of a point-to-point protocol with a neat diagram.
  4 M
- 5 c) Enumerate the differences between unicast, multicast and broadcast addresses? 2 M