Mid-Semester Examination, June-2022

Masters of Computer Applications (Semester II)

MCAC 204: Data Communications and Computer Networks

Unique Paper Code: 223401204

Year of admission: 2021

Time: One Hour **Max. Marks: 25**

1.	a.	When we use local telephones to talk to a friend, are we using a circuit switched network or a packet-switched network? Justify your answer.	2 marks
	b.	Assume seven devices are arranged in a mesh topology. How many cables are needed? How many ports are needed for each device? Draw the configuration.	3 marks
2.	a.	When a party makes a local telephone call to another party, is this a point-to-point or multipoint connection? Explain the answer.	2 marks
	b.	Identify the layer of TCP/IP protocol suite which best suits to the service given below. i. Responsibility for handling frames between adjacent nodes. ii. Transforming bits to electromagnetic signals. iii. Route determination.	3 marks
3.	a.	A device is sending out data at the rate of 1000 bps. How long does it take to send a file of 100,000 characters?	1 mark
	b.	The attenuation of a signal is -10 dB. What is the final signal power if it was originally 5 W?	1 mark
	c.	We have a channel with 4 KHz bandwidth. If we want to send data at 20 Kbps, what will be the SNR?	1 mark
	d.	A nonperiodic 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. Draw the frequency domain of the signal.	2 marks
4.	a.	An analog signal has a bit rate of 8000 bps and a baud rate of 1000 baud. How many data elements are carried by each signal element?	1 mark
	b.	Draw the data stream 0011001110111101 with graph of following line coding schemes, assuming that the last signal level has been positive. i. NRZ-I (If there is no change, the bit is 0) ii. NRZ-L (the voltage level for 0 is positive and the voltage level for 1 is negative) iii. AMI	3 marks
	c.	Briefly explain how FHSS achieves bandwidth spreading.	3 marks
	d.	Consider the network address 10.0.0.0/16. Calculate the following: i. number of possible subnets. ii. number of usable host addresses.	3 marks

Time = Data / Speed = 100,000 x 8