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RV COLLEGE OF ENGINEERING®

(An Autonomous Institution affiliated to VTU)

V Semester B. E. Examinations Jan/Feb-21

Computer Science and Engineering

COMPUTER COMMUNICATION AND NETWORKS

Time: 03 Hours ***Maximum Marks: 100***

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2, 7 and 8 are compulsory. Answer any one full question from 3 and 4 & one full question from 5 and 6

PART-A

1	1.1	State the importance of Address Resolution Protocol (ARP).	01
	1.2	If the frequency spectrum of a signal has a bandwidth of 600Hz with the highest frequency at 800 Hz, what should be the minimum sampling rate?	01
	1.3	Between NRZ and Manchester encoding techniques, which requires higher bandwidth and why?	01
	1.4	Assuming there is no noise in a medium of B=6 kHz, determine channel capacity when there are 8 levels of encoding	01
	1.5	In Go-Back-N ARQ, if 7 is the number of bits for the sequence number, the maximum size of the sender window is _____.	01
	1.6	List the various channelization techniques.	01
	1.7	In IEEE 802.11, _____is an optional access methods that can be implemented in an infrastructure network.	01
	1.8	Ports that are not part of the spanning tree are called _____ports.	01
	1.9	To prevent loops in system with redundant bridges, one can use _____ bridges.	01
	1.10	List the different configuration modes in HDLC.	01
	1.11	Calculate the number of chip sequences needed if we have 170 stations in our network?	01
	1.12	List the various methods used in CSMA protocol.	01
	1.13	If an Ethernet destination address is 07:01:02:03:04:05, identify the type of the address in it?	01
	1.14	What is the minimum number of bits in a PN sequence if we use FHSS with a channel bandwidth of $B = 4kHz$ and $B_{-SS} = 128kHz$	01
	1.15	If a coding scheme has minimum hamming distance of 7, how many bit errors can be corrected?	01
	1.16	To digitize a human voice, bit rate required is_____ if 9 bits per samples are used.	01
	1.17	Draw the format of data frame used in IEEE 802.11.	02
	1.18	After traversing a distance of 1km, power at the output and input of a communication link is 6kW and 15kW respectively. Find the attenuation in decibels. What is the attenuation in decibels after traversing a distance of 8km.	02

PART-B

2	a	Describe the star, bus and mesh topologies. Mention their advantages and disadvantages.	06
	b	Draw the ISO/ OSI reference model and TCP/IP model. How do the layers of these models correlate?	04
	c	Explain the various levels of addressing used in the operation of Internet.	06
3	a	Encode the data stream 101101001 using NRZ-L, NRZ-I, RZ, Manchester, Differential Manchester, AMI. Pseudo ternary and MLT-3 schemes.	08
	b	A video of size 270 MB is transmitted across a distance of 4500km using a link having a capacity of 24Mbps.Calculate the propagation delay and transmission time. If there are 6 routers on the way having processing speed of 5 milliseconds, what is the latency (total delay)? Assume $c = 3 \times 10^8$ metre/sec.	08
		OR	
4	a	Calculate the upper limit on the data rate of a link having a bandwidth of 45 kHz and the SNR of 30dB.	04
	b	State the purpose of block coding. If 1Mbps data is encoded using 4B/5B followed by NRZ, calculate the resulting bit rate, signal rate and minimum bandwidth	06
	c	Illustrate the various types of transmission modes and their scope in data communication	06
5	a	Four connections having data rate of 4 Mbps are time division multiplexed using 1bit unit. i) Estimate the speed of the multiplexed link ii) Identify the frame rate required. iii) What is the bit duration on the input and output link? iv) If 1 byte is taken from each input line, what is the length of the frame?	08
	b	With a diagram, explain the composition of co-axial cable and its transmission properties.	04
	c	Calculate the bit rate for the following. i) 16-QAM with 4000 baud ii) 8-PSK with 5000 baud	04
		OR	
6	a	Find the checksum for the following data. 45CA, A7B4, 8F42 and 6F3D. Show the verification process at the receiver.	06
	b	Calculate the codeword for the dataword 1100101 using CRC. The generator polynomial is 1011.	04
	c	Summarize the propagation modes of unguided media.	06
7	a	Demonstrate the working of the stop and wait protocol for the noisy channel. Write the pseudo code at the sender side.	06
	b	Generate the Walsh Table for 8 stations using $W_1 = [+1]$.	05
	c	Explain the polling method of multiple accesses.	05
8	a	Draw the IEEE 802.13 frame structure and state the relevance of each field.	06
	b	List the role of various connecting devices used in internetworking and the layers in which they operate.	06
	c	Bring out the salient features of ' Evolved Packet Core' architecture	04