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RV COLLEGE OF ENGINEERING®

(An Autonomous Institution affiliated to VTU)

V Semester B. E. Examinations Nov/Dec-19

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	In the *OSI* model when Data is transmitted from device *A* to device *B*, the header from *A's* layer 5 is read by *B's* _____ layer.	01
	1.2	A _____ address specifies a process on a host.	01
	1.3	A periodic signal completes one cycle in 0.0001 *sec*. What is the frequency?	01
	1.4	A sine wave is offset 1/6 cycle with respect to time 0. What is the phase in degrees and radians?	02
	1.5	A signal travels through an amplifier and its power is increased 10 times. In this case, calculate the amplification (gain of power).	01
	1.6	Mention the factors the data rate is dependent on.	02
	1.7	Compare fixed size framing and variable size framing.	02
	1.8	In a data link protocol, the frame delimiter flag is given by 0111. Assuming that bit stuffing is employed, the transmitter sends the data sequence 01110110 as _____.	01
	1.9	Find the minimum hamming distance of the coding scheme given in the table: *Dataword* | *Codeword* 00 | 00000 01 | 01011 10 | 10101 11 | 11110	02
	1.10	_____ can be achieved by using multiplexing; _____ can be achieved by using spreading.	02
	1.11	Define Piggybacking.	02
	1.12	In the _____ method, after the station finds the line idle, it sends its frame immediately. If the line is not idle, it continuously senses the line until it finds it idle.	01
	1.13	A _____ receives a signal and, before it becomes too weak or corrupted, regenerates the original bit pattern. It then sends the refreshed signal.	01
	1.14	A spanning tree is a graph in which there is no _____.	01

PART-B

2	a	Discuss the four fundamental characteristics of data communication system.	04
	b	With a neat block diagram, describe the OSI reference model.	07
	c	List and explain with examples, the four different types of addresses.	05
3	a	Briefly explain the three causes of transmission impairment with supporting diagrams.	06
	b	Explain the modulation of a digital signal for transmission on a Bandpass channel with relevant diagrams.	06
	c	If a periodic signal is decomposed into 5 sine waves with frequency of $100, 300, 500, 700$ and $900\,Hz$, what is the bandwidth? Draw the spectrum, assuming all components have maximum amplitude of $10V$.	04
		OR	
4	a	Demonstrate with neat diagrams, the polar line coding techniques.	06
	b	Discuss $8B/10B$ block encoding.	04
	c	With a suitable waveform diagram, explain the various steps involved in the Pulse Code Modulation (PCM).	06
5	a	Explain the Frequency Hopping Spread Spectrum ($FHSS$) mechanism and its scope in communication.	04
	b	With appropriate diagrams, discuss the design of twisted pair cable, categories and connectors used.	04
	c	List and explain the types of errors. Compute the checksum for the following data: $0x58CB, 0Xd7a4,$ and $0x6FCS$. Show the process of verification at the receiver.	08
		OR	
6	a	List the three basic multiplexing techniques. Explain any two with relevant diagrams.	07
	b	The sender is sending the data 1100101 using CRC where the generator is 11011. Compute the code word. What is the action taken by the receiver?	05
	c	Write a note on Radio waves and its applications.	04
7	a	Distinguish the send window and receive window in Go-Back-N and Selective Repeat Request protocols.	06
	b	Briefly explain Code-Division Multiple Access ($CDMA$) and also show how chip sequences are generated using Walsh table.	06
	c	Discuss the transition phases of Point-to-Point protocol with a supporting diagram.	04
8	a	With relevant fields, explain the frame format of $IEEE$ 802.3 Ethernet MAC Sub layer protocol.	06
	b	Classify the five categories of connecting devices and briefly explain.	06
	c	Summarize the advantages of $VLANs$.	04