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R. V. COLLEGE OF ENGINEERING

Autonomous Institution affiliated to VTU

V Semester B. E. Examinations Nov/Dec-18

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	Communication between a computer and a keyboard involves _____ mode of transmission.	01
	1.2	In the OSI model, as a data packet moves form the lower to the upper layers, headers are _____.	01
	1.3	The number of headers and trailers added by data link layer in TCP/IP protocol suite are _____ and _____ respectively.	01
	1.4	A channel is given with a bandwidth of $30\,kHz$ and a signal-to-Noise Ratio (SNR) of $40\,dB$. Calculate the channel capacity.	02
	1.5	Suppose two hosts, A and B separated by $10{,}000\,km$ and are connected by a direct link of $1\,Mbps$. Assume the propagation speed over the link is $2.5 \times 10^8\ m/s$. Calculate the bandwidth-delay product.	02
	1.6	What is the basic difference between a firewall and an antivirus?	01
	1.7	Bit stuff the following sequences when the flag 01111110 is used. a) 000111111011111011111001 b) 000111111111111111111111111111110011111001	02
	1.8	ARQ means retransmission of data in three cases: _____, _____ and _____.	01
	1.9	Six channels, each with a $150\,kHz$ bandwidth, are to be multiplied together. What is the minimum bandwidth of the link if there is a need for a guard band of $20\,kHz$ between the channels to prevent interference?	01
	1.10	In _____ TDM, the efficiency can be improved by removing the empty slots from the frame.	01
	1.11	For the given codeword, calculate the Hamming distance and minimum Hamming distance; $00000, 01011, 10101, 11110$.	02
	1.12	Assume that a Go-Back-N ARQ uses a window of size 15. How many bits are needed to define the sequence number?	01
	1.13	What is $CSMA/CD$?	01
	1.14	In Binary exponential Backoff algorithm, a random number between 0 and $2^k - 1$ is chosen. The doubling of the contention window stops after $k =$ _____ collisions and the process is aborted after $k =$_____ collisions.	01
	1.15	The minimum and maximum length of an Ethernet frame is _____ and _____.	02

PART-B

2	a	Discuss the basic modes of communication needed for a data to flow between two devices.	04
	b	Compare OSI versus TCP/IP model.	06
	c	Explain types of addresses used in different layers of TCP/IP data communication model with example.	06
3	a	With proper diagram discuss the baseband and broadband transmissions.	06
	b	What is Scrambling? Explain any one scrambling techniques in detail.	06
	c	The loss in a cable is usually defined in decibels per kilometer (dB/km). If the signal at the beginning of a cable with $-0.3\ dB/km$ has a power of $2\ mW$, what is the power of the signal at $5\ km$?	04
		OR	
4	a	With proper diagrams discuss the causes of impairment in transmission media.	06
	b	Explain with neat diagrams the modulation and demodulation components in the process of delta modulation.	06
	c	The power of a signal is $10\ mV$ and the power of the noise is $1\mu W$. What are the values of SNR and SNR_{dB}? Also find the values fo SNR and SNR_{dB} for a noiseless channel?	04
5	a	Demonstrate the interleaving process for a connection using TDM.	06
	b	A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is x^3+1. Show the actual bit string transmitted. Suppose the third bit form the left is inverted during transmission. Show that this error is detected at the receivers end.	06
	c	Briefly explain the propagation modes in fiber optic cable.	04
		OR	
6	a	With simple implementation, discuss Amplitude Shift Keying.	06
	b	Calculate the sender side and receiver side internet checksum for a text string “Forouzan”.	06
	c	Briefly discuss the guided transmission media.	04
7	a	Distinguish the send window and receive window in Go-Back-N and Selective Repeat ARQ protocols.	06
	b	Briefly explain Code-Division Multiple Access ($CDMA$) and also show how chip sequences are generated using Walsh table.	06
	c	What is the advantage of token passing protocol over $CSMA/CD$ protocol?	04
8	a	With relevant fields, explain the frame format of $IEEE$ 802.3 Ethernet MAC Sub layer protocol.	06
	b	What is Backbone Network? Explain Bus Backbone and Star Backbone.	06
	c	Compare $4G$ and $5G$ with various aspects.	04