IS34

USN	1	M	S							

RAMAIAH Institute of Technology

(Autonomous Institute, Affiliated to VTU)
(Approved by AICTE, New Delhi & Govt. of Karnataka)
Accredited by NBA & NAAC with 'A+' Grade

SEMESTER END EXAMINATIONS – MARCH 2022

Program	:	**B.E. : Information Science and Engineering**	**Semester**	:	**III**
Course Name	:	**Data Communications**	**Max. Marks**	:	**100**
Course Code	:	**IS34**	**Duration**	:	**3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit

UNIT- I

1. a) Define the term Data communications. Briefly discuss the fundamental characteristics of Data Communication. CO1 (06)
   b) Give the comparison between point-to-point and multipoint link. CO1 (04)
   c) Explain the significance of various protocols supported in different layers of TCP/IP reference model. CO1 (10)

2. a) Give the relationship among layers and addresses in TCP/IP layered architecture. CO1 (06)
   b) Calculate number of cable links for a Mesh and Ring topology for *n* devices in a network. CO1 (04)
   c) Briefly discuss the basic and additional functionalities supported in Physical and Datalink layer in OSI reference model. CO1 (10)

UNIT – II

3. a) What is transmission impairment? Briefly explain its causes with necessary diagrams. CO2 (10)
   b) Define the following: CO2 (10)

(i)	Peak Amplitude	(vi)	Wavelength
(ii)	Bit Rate	(vii)	Bandwidth
(iii)	Bit Length	(viii)	Throughput
(iv)	Phase	(ix)	Jitter
(v)	Frequency	(x)	Low pass channel

4. a) Write a brief note on the theoretical formulas to calculate the data rate in noiseless and noisy channels. We have a channel with a 2-Mhz bandwidth. The SNR for this channel is 63. What are the appropriate bit rate and signal level? (to calculate signal level consider the bit rate to be 2Mbps less than the upper limit) CO2 (10)
   b) Convert the digital data "0011010" to digital signal using Unipolar NRZ, Polar NRZ-I, Polar RZ, Differential Manchester and AMI schemes. Clearly state the rules used in representing bit 0 and bit 1 using the above schemes. CO2 (10)

UNIT – III

5.	a)	Write the sender and receiver site algorithm for Go-Back-N ARQ protocol.	CO3	(06)
	b)	Explain the working principle of encoder and decoder for simple parity-check code.	CO3	(04)
	c)	Let $g(x)=x^3+x+1$. Consider the information sequence 1001. i) Find code word corresponding to the preceding information sequence using CRC polynomial encoding technique. ii) Suppose the codeword does not have any transmission error. What does the receiver obtain when it does its error checking?	CO3	(10)
6.	a)	Illustrate the working of two dimensional parity check code and explain how many bit errors can be detected in two dimensional parity check code.	CO3	(06)
	b)	Explain the concept of bit stuffing and byte stuffing in character and bit oriented protocols.	CO3	(04)
	c)	Justify the statement *In "Selective Repeat ARQ, the size of the sender and receiver window must be at most one-half of 2^m".*	CO3	(10)

UNIT – IV

7.	a)	What is controlled access? List the properties of the orthogonal sequences of CDMA method with examples.	CO4	(10)
	b)	What are the services offered by point-to-point protocol? Briefly explain its transition phases.	CO4	(10)
8.	a)	A pure ALOHA network transmits 300-bit frames on a shared channel of 300 kbps. How many frames survive, if the system (all stations together) produces: (i) 1000 frames per second (ii) 500 frames per second (iii) 250 frames per second	CO4	(10)
	b)	With the flow diagram, explain the procedure of CSMA/CD used by the stations for accessing the channel.	CO4	(10)

UNIT – V

9.	a)	Illustrate the creation of loops while learning by a transparent bridge. Explain how looping problem is resolved.	CO5	(12)
	b)	With a neat diagram, explain the layered architecture of Bluetooth.	CO5	(08)
10.	a)	Briefly describe with relevant diagrams, the different cases of IEEE 802.11 addressing mechanisms.	CO5	(12)
	b)	Write a brief note on the following: (i) Hidden station problem (ii) Exposed station problem.	CO5	(08)

****