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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 FEBRUARY - MARCH 2021

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)	Briefly discuss the advantages and disadvantages of Mesh and Star topologies.	CO1	(10)
	b)	Give the relationship among layers and addresses in TCP/IP layered architecture.	CO1	(05)
	c)	Briefly discuss the significance of the following protocols: ARP; RARP; ICMP; IGMP; TCP and UDP.	CO1	(05)
2.	a)	Explain the functionalities of different layers in OSI reference model.	CO1	(10)
	b)	Briefly discuss the significance of different standard creation committees.	CO1	(05)
	c)	Illustrate the working of logical and physical addresses while communicating data.	CO1	(05)

UNIT – II

3.	a)	The power of a signal is 10milli Watt and the power of the noise is 1 micro Watt; What are the values of SNR and SNR_{dB}?	CO2	(06)
	b)	Illustrate the process of Bandwidth-Delay product by considering different cases.	CO2	(06)
	c)	Draw the graph of the Manchester and Differential Manchester schemes for the following data streams: i. 10101010 ii. 11110000 iii. 00110011 iv. 11111111	CO2	(08)
4.	a)	Justify the statement *"according to nyquist theorem, the sampling rate must be atleast 2 times the highest frequency contained in the signal"* with an example.	CO2	(06)
	b)	We need to send 265 kbps over a noiseless channel with a bandwidth of 20kHz. How many signal levels do we need?	CO2	(04)
	c)	Illustrate the process of Quantization on the sample PAM values: -9.1, 11.5, 18.2, 7.0, -8.3, -9.4 and -10.5. Consider the peak amplitudes as 20V and number of levels as 8.	CO2	(10)

UNIT – III

5.	a)	Illustrate the Transition phase of Point to point protocol connection. Explain with the neat diagram the PPP frame format.	CO3	(10)
	b)	Define Linear block code with an example. A sender needs to send the four data items 0x3456, 0xABCC, 0x02BC and 0xEEEE. i. Find the checksum at the sender site ii. Find the checksum at the receiver site iii. Find the checksum at the receiver site if the second data item is changed to 0xABCE and the third data item is changed to 0x02BA	CO3	(10)
6.	a)	Explain the different arithmetic and logical operations that are performed with polynomials. Node A want to send a short message 101001111 using the CRC with the generator as 10111 to node B. Calculate the redundant bits and the augmented codeword.	CO3	(10)
	b)	The size of the send window must be less than 2^m, explain with a scenario. Write and explain the sender side algorithm of Go-back N ARQ protocol.	CO3	(10)

UNIT – IV

7.	a)	A slotted ALOHA network transmits 500-bit frames on a shared channel of 500 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	(09)
	b)	Illustrate the chip sequence generation using Walsh Table in Code Division Multiple Access (CDMA) method.	CO4	(05)
	c)	With respect to CSMA/CD, elaborate the need of the following: (i) Inter-frame Space(IFS) (ii) Contention Window.	CO4	(06)
8.	a)	What is controlled access? Briefly describe the following with diagrams: (i) Reservation method (ii) Token Passing method (iii) Polling.	CO4	(10)
	b)	With the flow diagram, explain the procedure of CSMA/CA used by the stations for accessing the channel.	CO4	(10)

UNIT – V

9.	a)	Giving the format, describe the different fields of 802.3 MAC Frame.	CO5	(10)
	b)	Illustrate how looping problem is resolved in a learning bridge.	CO5	(10)
10.	a)	Elaborate on the access method used by the standard Ethernet.	CO5	(10)
	b)	Discuss the problems and their solutions in IEEE 802.11 wireless LANs.	CO5	(10)

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