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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 – AUGUST 2024

Program	:	**B.E :- Computer Science and Engineering**	**Semester**	:	**IV**
Course Name	:	**Data Communication and Networking**	**Max. Marks**	:	**100**
Course Code	:	**CS44(00)**	**Duration**	:	**3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1.	a)	Differentiate between Bus and Star network topologies.	CO1	(06)
	b)	Explain the techniques of Digital-to-Digital Conversion.	CO1	(06)
	c)	Explain the following basic Multiplexing Techniques: i. Frequency-Division Multiplexing ii. Time-Division Multiplexing.	CO1	(08)
2.	a)	Explain the layers of TCP/IP protocol suite.	CO1	(10)
	b)	Differentiate between amplitude modulation, frequency modulation and phase modulation.	CO1	(06)
	c)	What are the types of addresses (identifiers) used in each of the following layers and explain each? i. Application layer ii. Network layer iii. Transport Layer iv. Data-link layer.	CO1	(04)

UNIT - II

3.	a)	Draw and explain the sequence diagram for the Go Back N protocol.	CO2	(08)
	b)	Given the dataword 101001111 and the divisor 10111, show the generation of the CRC codeword at the sender site (using binary division).	CO2	(06)
	c)	Discuss how to handle the collision in Carrier sense multiple access with collision detection (CSMA/CD). A network using CSMA/CD has a bandwidth of 10 Mbps. If the maximum propagation time (including the delays in the devices and ignoring the time needed to send a jamming signal, as we see later) is 25.6 μs, what is the minimum size of the frame?	CO2	(06)
4.	a)	Consider a dataword 1001 and the Generator polynomial 10011, Compute the sent codeword using CRC and also find the syndrome if the received codeword is 1000110.	CO2	(06)
	b)	Write the sender site selective repeat algorithm by considering all the cases and explain.	CO2	(06)
	c)	Draw the flow diagram to show the working of CSMA/CA protocol.	CO2	(08)

UNIT - III

5.	a)	Define two MAC sublayers in the IEEE 802.11 Standard.	CO3	(08)
	b)	Illustrate classful addressing with a block allocation diagram.	CO3	(08)
	c)	Explain Three different notations in IPv4 addressing with neat diagram.	CO3	(04)
6.	a)	With a neat block diagram, Explain the Ethernet frame format.	CO3	(08)
	b)	Illustrate classful addressing with a block allocation diagram.	CO3	(06)
	c)	Explain the Link state routing algorithm with an example.	CO3	(06)

UNIT- IV

7.	a)	Describe UDP datagram format. How does UDP perform error detection?	CO4	(06)
	b)	Suppose that the two measured *Sample RTT* values are 106 ms, and 115 ms. Compute the *Estimated RTT* after each of these *Sample RTT* values is obtained, using a value of $\alpha = 0.125$ and assuming that the value of *Estimated RTT* was 100 ms just before the first of these two samples were obtained. Compute also the *Dev RTT* after each sample is obtained, assuming a value of $\beta = 0.25$ and assuming the value of *Dev RTT* was 5 ms just before the first of these two samples was obtained. Last, compute the TCP *Time out Interval* after each of these samples is obtained.	CO4	(06)
	c)	Illustrate the working of RIP protocol in detail. Mention the problems related to RIP and how some of them could be solved.	CO4	(08)
8.	a)	Discuss how the inter-autonomous system routing is done using BGP.	CO4	(08)
	b)	Explain the typical sequence of states visited by a TCP client.	CO4	(06)
	c)	Illustrate slow start TCP congestion control mechanism with neat figure.	CO4	(06)

UNIT - V

9.	a)	Explain HTTP response message format with example.	CO5	(06)
	b)	With a neat sketch Explain how SMTP operates when A send mail to B, where the mail server of A and B are different. Show the sequence of events.	CO5	(08)
	c)	Discuss why FTP is called out-of-band protocol. List few FTP commands and replies.	CO5	(06)
10.	a)	Explain the DNS Message format for both query and reply.	CO5	(06)
	b)	Discuss whether HTTP is a stateless or stateful protocol. Consider an e-commerce site that wants to keep a purchase record for each of its customers, describe how this can be done with cookies.	CO5	(06)
	c)	Discuss the file distribution using BitTorrent with an example and write the suitable formulas used for distributing file using client server approach and point-to-point approach.	CO5	(08)

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