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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

SUPPLEMENTARY SEMESTER EXAMINATIONS – JULY/AUGUST 2018

Course & Branch	:	**B.E. : Computer Science and Engineering**	**Semester**	:	**IV**
Subject	:	**Data Communication**	**Max. Marks**	:	**100**
Subject Code	:	**CS44/CS1544/CS415**	**Duration**	:	**3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	Compare and contrast star, ring, mesh and bus topologies along with their advantages and disadvantages	CO1	(10)
	b)	Write TCP/IP protocol suite. Discuss addressing and object created at different layers.	CO1	(05)
	c)	What is the phase shift for the following? i) A sine wave with the maximum amplitude at time zero ii) A sine wave with maximum amplitude after 1/4 cycle iii)A sine wave with zero amplitude after 3/4 cycle and increasing.	CO1	(05)
2.	a)	Discuss functions associated with each layer of TCP/IP and also list the respective protocols.	CO2	(08)
	b)	Distinguish between baseband transmission and broadband transmission.	CO1	(07)
	c)	What is the total delay (latency) for a frame of size 5 million bits that is being sent on a link with 10 routers each having a queuing time of 2 μs and a processing time of 1 μs. The length of the link is 2000 Km. The speed of light inside the link is 2x10 8 m/s. The link has a bandwidth of 5 Mbps. Which component of the total delay is dominant? Which one is negligible?	CO1	(05)

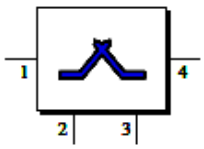
UNIT – II

3.	a)	Explain 4B/5B scheme with example.	CO3	(06)
	b)	Classify and explain different propagation modes the current technology supports for propagating light along the optical channels.	CO3	(06)
	c)	Draw the constellation diagram for the following cases. Find the peak amplitude value for each case and define the type of modulation (ASK, FSK, PSK, or QAM).The numbers in parentheses define the values of I and Q respectively. i. Two points at (2, 0) and (3, 0) ii. Two points at (3, 0) and (−3, 0) iii. Four points at (2, 2), (−2, 2), (−2, −2), and (2, −2) iv. Two points at (0, 2) and (0, −2).	CO3	(08)
4.	a)	Draw the line coding graph for NRZ-L, NRZ-I, Manchester, Differential Manchester, AMI and Pseudo ternary schemes for the following data stream: 10011010.	CO3	(06)
	b)	Identify the two principles used to achieve the goals of spread spectrum and Describe FHSS with example and block diagrams.	CO3	(10)
	c)	Explain Binary ASK and estimate the bandwidth requirement for BASK.	CO3	(04)

UNIT – III

5.	a)	With a block diagram explain parity check encoder and decoder. Assuming the sender sending the data word 1011. The codeword created is 10111 which is sent to the receiver. Examine five different cases for error detection.	CO4	(09)
	b)	Given the data word 10110011101 and generator 10011, show the generation of codeword at the sender site using CRC (using binary division). Also perform the division in the CRC decoder to calculate the syndrome bits and interpret the same.	CO4	(05)
	c)	Differentiate between circuit switching and packet switching.	CO3	(06)
6.	a)	With an example, explain connection setup phase in virtual circuit switching. Figure shows a switch in a virtual-circuit network.	CO3	(06)

Incoming		Outgoing	
Port	VCI	Port	VCI
1	14	3	22
2	71	4	41
2	92	1	45
3	58	2	43
3	78	2	70
4	56	3	11



Find the output port and the output VCI for packets with the following input port and input VCI addresses:

i) Packet 1: 3,58 ii) Packet 4: 2, 71.

	b)	List the steps involved in three stage switch. Apply the steps and design a three stage 200x200 switch with k=4 and n=20.	CO4	(06)
	c)	Generate the codeword for the given data 1011101 using Hamming distance. Introduce an error in bit position 2 and demonstrate how error is detected and corrected at the receiver site.	CO4	(08)

UNIT – IV

7.	a)	With a flow diagram, explain the working of CSMA/CD.	CO6	(08)
	b)	Explain the design of Go-back N ARQ protocol. With the help of relevant diagrams explain how the window size is chosen in Go-back N ARQ protocol.	CO5	(06)
	c)	Compare and contrast with examples bit stuffing and byte stuffing.	CO5	(06)
8.	a)	With necessary flow chart, explain the working of pure ALOHA protocol.	CO6	(08)
	b)	Summarize the similarities and differences in CSMA,CSMA/CD and CSMA/CA in media access.	CO6	(06)
	c)	"The size of the sender and receiver window must be at most one-half of 2m in selective repeat ARQ". Justify this statement with examples.	CO5	(06)

UNIT – V

9.	a)	With a neat frame format describe in detail Ethernet frame.	CO6	(08)
	b)	How do you reduce the probability of collision in Ethernet? Summarize the different mechanisms used with respect to Ethernet in avoiding collision?	CO6	(07)
	c)	Differentiate the architectures of Piconet and Scatternet.	CO6	(05)
10.	a)	With neat a frame format describe in detail wireless LAN frame.	CO6	(10)
	b)	Explain with a neat diagram encoding in Gigabit Ethernet.	CO6	(06)
	c)	Explain the characteristics of wireless LANs.	CO6	(04)

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