CS1544/CS415

RAMAIAH
INSTITUTE OF TECHNOLOGY

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MAKEUP EXAMINATIONS – MAY/JUNE 2017

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

Instructions to the Candidates:
- Answer one full question from each unit.
- Write figures wherever necessary.

UNIT - I

1.
   a) Define Protocol and explain briefly the key elements of a protocol. — CO1 (04)
   b) Explain any four functions of Physical layer and Data link layer . — CO2 (08)
   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 -0.3dB/km has a power if 2mW. What is the power of the signal at 5 km. — CO2 (04)
   d) What is the theoretical capacity of the channel in the following case $SNR_{db}=36$, B=2MHz — CO2 (04)

2.
   a) Mention and explain the four levels of addressing used In the internet employing TCP/IP protocols. — CO2 (05)
   b) Match the functions to one of the layers in the TCP/IP Model: — CO2 (05)
      i) Route determination
      ii) Defines frames
      iii) Reliable process to process message delivery
      iv) Provides user services such as e-mail and file transfer Interface to transmission media.
   c) Explain the three types of Transmission Impairment. — CO2 (06)
   d) What are the propagation time and the transmission time for a 2.5kbyte message if the bandwidth of the network is 1Gbps? Assume the distance between the sender and the receiver is 12,000 km and that light travels a 2.4×10^8m/s. — CO2 (04)

UNIT - II

3.
   a) Discuss how to convert analog data to digital data using Pulse Code Modulation. — CO3 (08)
   b) Differentiate between Frequency Hopping Spread Spectrum and Direct Sequence Spread Spectrum. — CO3 (08)
   c) What is the result of scrambling the sequence 1010000000010 using each of the following scrambling techniques? Assume that the last non-zero signal level has been positive. — CO3 (04)
      i. B8ZS
      ii. HDB3

4.
   a) Explain Delta modulation and differentiate between statistical TDM and synchronous TDM. — CO3 (08)
   b) Explain the process of digital to analog conversion. — CO3 (08)

	c)	Four 1-kbps connections are multiplexed together. A unit is 1 bit. Find
		  i. the duration of 1 bit before multiplexing
		  ii. the transmission rate of the link
		  iii. the duration of a time slot
		  iv. the duration of a frame.
			CO3	(04)

UNIT - III

5.	a)	Differentiate between circuit switching, packet switching and virtual circuits.	CO3	(08)
	b)	Explain the procedure and algorithm for calculating Internet checksum.	CO4	(08)
	c)	Find the status of the following generators related to two isolated, single-bit errors. i) $x + 1$ ii) $x^4 + 1$ iii) $x^7 + x^6 + 1$ iv) $x^{15} + x^{14} + 1$	CO4	(04)
6	a)	Explain the different ways of forward error correction.	CO4	(08)
	b)	Discuss the structure of circuit switches.	CO3	(08)
	c)	Given the dataword 101001111 and the divisor 10111, show the generation of the CRC codeword at the sender site.	CO4	(04)

UNIT – IV

7.	a)	Explain the concept of Bit stuffing and unstuffing with example.	CO5	(04)
	b)	Bring out the procedure for Go Back N sender algorithm.	CO5	(07)
	c)	Explain the control field of HDLC frame in detail with control field format for the different frame types.	CO5	(05)

	d)	A slotted ALOHA network transmits 200 bit frames using a shared channel with a 200 kbps bandwidth. Find the throughput if the system produces:
		  i) 1000 frames per second
		  ii) 500 frames per second
		  iii) 250 frames per second.
			CO6	(04)

8.	a)	Illustrate with flow diagrams why window size in Selective repeat ARQ should not exceed 2^{m-1}. Show both the cases.	CO5	(04)
	b)	Explain in detail the two Authentication Protocols used in PPP with appropriate block diagrams.	CO5	(08)
	c)	Write the flow diagram for the CSMA/CD protocol.	CO6	(08)

UNIT - V

9.	a)	Describe 802.3 MAC frame format with a block diagram.	CO6	(06)
	b)	With a neat block diagram explain the CSMA/CA flowchart for wireless LAN's.	CO6	(08)
	c)	What characteristics can be used to group stations in a VLAN? Explain any four.	CO7	(06)
10.	a)	Explain Hidden Station and Exposed Station problems. Bring out their solutions if any.	CO6	(08)
	b)	Compare a piconet and a scatternet.	CO6	(04)
	c)	With an example, explain the looping problem in Bridges, also explain how it can be overcome by using Spanning Tree approach.	CO7	(08)

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