*5th Sem <Re'?Ular)* CN (IT-3001) (CSE,11)



AUTUMN END SEMl:STER EXAMINATION-2015

5th Semester B.Tech & B.Tech Dual Degree

# COMPUTER NETWORKS (IT-3001)

(Regular-2013 Admitted Batch)

Full Marks: 60 1fime: 3 Hours

*Answer any SIX questions including Question No.I which is c11mpulsory.*

*Thefigures in the margin indicatefull marks.*

*Candidates are required to give their answers in their own words asfar aspracticable and all parts o{ a question should be answered at one place only.*

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| 1. | a) | In TCP, if the value of HLEN is 0111, how many bytes of [2 x 10 options are included in the segment? |
|  | b) | Differentiate datagram subnet and virtual circuit subnet. |
|  | c) | How does the performance get improved in CSMNCD protocol compared to CSMA protocol? |
|  | d) | How many Class C networks are there? Explain, the reason for the same. |
|  | e) | Ifflow control and error control are performed at the data |
|  |  | link layer, then why is it also necessary to perform flow and error control at the transport layer? |
|  | f) | How does an ARQ system deal with packet loss? |
|  | g) | What do you mean by count to infinity problem, e:i(plain |
|  |  | with proper example. |
|  | h) | With a neat sketch discuss UDP header. |
|  | i) | How throughput is improved in slotted ALOHA oveT pure |
|  |  | ALOHA? |

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1. In a TCP connection, the initial sequence number at the client site is 210. The client opens the connection, sends 1000 bytes of data successfully, and closes the connection. What is the value of the sequence number in each of the following segments sent by the client?
   * The SYN segment
   * The FD'-l" segment

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| 2. | a) | An administrator has an IP 192.168.1.0124 and wants to  form subnets for 4(four) departments with 100, 50, 25, and | [4 |
|  |  | 5 hosts. Design a possi ble arrangement of subnets to make |  |
|  |  | each dpartmcnt in a different subnet. For each subnet, give subnet mask and range ofIP addresses. |  |
|  | b) | Li st out the advantages and disadvantages of star and ring topology. | [4 |

1. a) Suppose two hosts, A and B, are separated by 20,000 [4 kilometers and are connected by a direct link of R = 2 Mbps. Suppose the propagation speed over the link is 2.5x108 meters/sec.
   1. Calculate the bandwidth-delay prod uct.
   2. Consider sending a file of 800,000 bits from Host A to Host B. Suppose the file is sent continuously as one large message. What is the maximum number of bits that will be in the link at any given time?
   3. What is the width (in meters) of a b[t in the link? Is it longer than a football field?

b) Explain in detail how SMTP send your email to your friend's [4 mailbox.

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| 4. | a) | The distance from earth to a distant planet is approximately 9 x 1010 m. What is the channel utilization if a stop-and- | *[2* |
|  |  | wait protocol is used for frame transmission on a 64 Mbps |  |
|  |  | point·-to-point link? Assume that the frame size is 32 KB and the speed of light is 3 x 108 m/s. |  |
|  | b) | What do you mean by congestion control? Explain the | [6 |
|  |  | methods involved in TCP slow start to avoid congestion |  |
|  |  | control. |  |

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| 5. | a) | Explain Addressing and Channel access control mechanism for Ethernet LAN. | [4 |
|  | b) | Consi der sending a 2400-byte datagram into a link that has an MTU of 700 bytes. Suppose the original datagram is | (5 |
|  |  | stamped with the identification number 422. How many |  |
|  |  | fragments are sent out of the host and specify fragment size, |  |
|  |  | identification number, identification flags, and fragment |  |
|  |  | offset of each fragment. |  |

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| 6. | a) | Expla.in with example, a transport layer sender and receiver | [3 |
|  |  | with non-pipeline reliable data transfer protocol over a Iossy ·channel. |  |
|  | b) | Find lthe code word using harmning code method for the data bits 101011001 110. | (3 |

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| 7. | a) | Explain how CRC is used in detecting errors for the | [4 |
|  |  | polynomial, g(x)=x 4 +x+L Consider the information |  |
|  |  | sequence 1101011011.  (i) Find the codeword. |  |
|  |  | (ii) l f the code word has error in third bit, what does |  |

# receiver obtain when it does error checking.

(3)

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b) Explain Distance vector routing algorithm along with its limitation and how it has been overcome.

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1. *Answer anyfour questions* [2 x 4
   1. RIP vsOSPF
2. Open loop vs Close loop congestion control
3. Forward error vs backward error correction
4. Hamming distance
5. Limited vs Directed Broadcast

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