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25/4/16

6th Sem (Back)

CN IT-603

(CSE, IT)

## SPRING END SEMESTER EXAMINATION-2016

6<sup>th</sup> Semester B.Tech & B.Tech Dual Degree

### COMPUTER NETWORKS

#### IT-603

(Back-2012 & Previous Admitted Batches)

**Time: 3 Hours**

**Full Marks: 60**

*Answer any SIX questions including Question No.1 which is compulsory.*

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.*

1. a) List two ways in which the OSI reference model and the [2 × 10 TCP/IP are the same & list two ways in which they differ.
- b) Distinguish between Multiple Unicasting and Multicasting.
- c) One way of detecting errors is to transmit data as a block of n rows of k bits per row and adding parity bits to each row and each column. Will this scheme detect all single errors? Double errors?
- d) If flow 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?
- e) List out the advantages and drawbacks of bus topology.
- f) Suppose you wanted to do a transaction from a remote client to a server as fast as possible. Would you use UDP or TCP? Why?
- g) Discuss the significance of MAC address, IP address and port numbers.

(1)

- h) Differentiate datagram subnet and virtual circuit subnet.
  - i) What is Reverse Address Resolution Protocol(RARP)?
  - j) In Stop-and-Wait ARQ, the sequence numbers are based on modulo-2 arithmetic. Why?
2. a) Using 5-bit sequence number, what is the maximum size of the send and receive windows for each of the following protocols? [4]
- (i) Stop-Wait protocol
  - (ii) Selective-Repeat ARQ
- b) Discuss Link State Routing protocol with example. [4]
3. a) The distance from earth to a distant planet is approximately  $9 \times 10^{10}$  m. What is the channel utilization if a stop-and-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  $3 \times 10^8$  m/s. [4]
- b) Explain, how data communication between sender and receiver happens using different layers of TCP/IP Stack. [4]
4. a) Discuss CSMA/CD protocol. Explain why it is not suitable for wireless LAN. [4]
- b) Suppose the original datagram is stamped with the identification number 422. How many fragments are generated? What are the values in the various fields in the IP datagram(s) generated related to fragmentation? [4]
5. a) A bit of stream 10011101 is transmitted using the standard CRC method. The generator polynomial is  $x^3+1$ . Show [4]

the actual bit string transmitted. Suppose the third bit from the last is inverted during transmission. Show that this error is detected at the receiver's end.

- b) What do you mean by congestion control? Explain the methods involved in TCP slow start to avoid congestion control. [4]

6. a) For the given bit sequence 1011110111, draw the Manchester and differential Manchester encoding. Explain the limitations of Manchester encoding and how it is overcome using differential Manchester encoding. [4]

- b) Explain different types of transmission impairments in data communication. [4]

7. a) An administrator has an IP 192.168.1.0/24 and wants to form subnets for four departments, as shown the table. [4]

Design a possible arrangement of subnets to make each department in a different subnet. For each subnet, give subnet mask and range of IP addresses.

Technical	100 hosts
Sales	50 hosts
Accounts	25 hosts
HR	5 hosts

- b) Describe how Web caching can reduce the delay in receiving a requested object. Will Web caching reduce the delay for all objects requested by a user or for only some of the objects? Why? [4]

8. Answer all questions.

[2 × 4

- a) DNS in Internet
- b) Electronic mail
- c) UDP header format
- d) Poison reverse

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