AUTUMN END SEMESTER EXAMINATION-2017

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

COMPUTER NETWORKS

IT-3001

(Regular-2015 & Back of 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. Answer the following. [2 × 10]

(a) Give an example for each of the half-duplex and full duplex communication.

(b) What is hamming distance? Calculate the Hamming distance between 1001002010011.

(c) Explain at what circumstance the queue of the input port is going to built up during routing of a packet at the router.

(d) In a given IP address 192.168.0.10, find out which class it belongs to, how many hosts and networks are possible in that network.

(e) Differentiate between MAC layer and Logical Link Layer.

(f) Write two advantages of connectionless protocol over connected protocol.

(g) Distinguish between Telephone Network and packet-switched network.

(h) What is a sign of a congestion in a network and describe how t make sure whether the network is slightly/heavily congested.

(i) What is the data rate of Ethernet, Fast Ethernet and Gigabit Ethernet?

(j) What is the need of fragmentation? Describe why the re-assembly of the fragments happens at the destination, rather than the intermediate machines.

2. (a) Illustrate and explain stop-and-wait ARQ protocol. Consider a computer network which sends the packet with size of 1000 bits of data using stop-and-wait ARQ protocol. Assume that neither the control nor data frame is lost or damaged in the transmission process of data. If the distance between source and destination is 400Km and the propagation speed is 2×10^8 m/sec each packet, find the time to send 10000 bits? [4]

(b) If Go-Back-N ARQ protocol with a window size 7 is used, what will be the time to send 10000 bits considering the packet size, distance between source and destination and propagation speed same as given in Q2(a). [4]

3. (a) What is CSMA/CD? Consider a computer network with one primary and four secondary stations uses polling. The data frame size, poll size, size of ACK, and the size of NAK frames are 32 bytes each respectively. Assume that each station has 2 frames to send. Find the total number of frames exchanged due to (i) polling and transfer and (ii) polling and sending NAKs. [4]

(b) Differentiate between Token ring and token bus. What will be the maximum efficiency of the token ring if there are 100 stations with token rotation time of 40 ms and token holding time of 10msec? [4]

4. (a) An organization is granted a block of addresses with a beginning address 172.16.11.0/24. The organization needs to have 4 subnets, with [4]

Subnet 1 :- 40 hosts, Subnet 2 :- 110 hosts, Subnet 3 :- 25 hosts and Subnet 4 :- 10 hosts.

Design the Subnets.

(b) What do you mean by looping in transparent bridges? How it is avoided with a spanning tree? [4]

5. (a) Given a dataword 101001111 and the divisor 10111, show the generation of CRC code word at the sender side. [4]

(b) During closing of a connection whether the client/server initiates the connection teardown process. Explain whether the client/server will enter into TIME-WAIT state and why. [4]

6. (a) Describe significance of each header field in IPV_4 packet format. [4]

(b) Identify the address class of the following IP addresses: (i) 200.58.20.165, (ii) 128.167.23.20, and 250.10.24.96. The hexadecimal representation of an IP address is C22E2461. What is the corresponding dotted decimal notation? Also identify the net address, host address and types of class. [4]

7. (a) What are different components in a router? Distinguish between Router and Gateway. Justify that Repeater c Bridge c Router c Gateway where symbol c represents "subset of". [4]

(b) Consider a router needs to process a packet with destination address 200.140.10.81. Clearly show the steps necessary by the router to route the packet to the above destination. [4]

8. Write short notes on *any four*. [2 ×

(a) Link-state Routing

(b) ICMP Protocol

(c) Packet switching & Circuit Switching

(d) FTP and SMTP

(e) P2P and Client-Server Communication

(f) RPC

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