Code : 051513

B.Tech 5th Semester Exam., 2014

COMPUTER NETWORKS

Time : 3 hours *Full Marks* : 70

Instructions :

(i) All questions carry equal marks.

*(ii) There are **EIGHT** questions in this paper.*

*(iii) Attempt **FIVE** questions in all.*

*(iv) Question No. **1** is compulsory.*

1. Write short answer for any *seven* of the following :

(a) Differentiate among circuit switching, packet switching and message switching.

(b) Compute the bit rate for a 12000 basic baud using 32-QAM signal.

(c) Compute the signal-to-noise ratio in dB of a link with channel capacity 80 Mbps and bandwidth of 8 MHz.

(d) Differentiate between 1-persistent CSMA and P-persistent CSMA protocols.

(e) Describe Nyquist theorem.

(f) What is flooding? How to reduce resource consumption in the network?

(g) What is sliding window mechanism?

(h) Differentiate between connectionless and connection-oriented services.

(i) What is pulse-amplitude modulation? What are its disadvantages?

(j) What is dotted decimal notation in IP addressing?

2. *(a)* Using differential Manchester encoding scheme, draw the time vs. amplitude graphs for the bit stream 0101101001.

(b) In a digital system with 8 input links are multiplexed using STDM. Each input source is creating 1024 bits per second. Each frame contains 8 bits from each source and adds 1 bit as a framing bit. Compute the number of frames transmitted per second, and the data capacity of the link.

3. *(a)* A channel has a bit rate of 4 kbps and a propagation delay of 20 milliseconds. For what range of frame size does stop-and-wait give an efficiency of at least 50 percent?

(b) Compute the CRC for an 8-bit sequence 10100001 and a divisor of $3x+1$.

4. *(a)* Describe the design issues for the layers. Also give the diagram for TCP/IP model with protocols and layers.

   (b) Why is slot reservation needed in DQDB? Describe the slot reservation method used in DQDB.

5. *(a)* Differentiate between adaptive and non-adaptive routing algorithms.

   (b) How does link state routing take care of the problem of wrapping of sequence numbers, crashing of routers and corruption of sequence number?

6. *(a)* Why does UDP exist? Would it not have been enough to just let user processes send raw IP packets? Justify.

   (b) What is the purpose of the following fields in TCP segment header?

   (i) Urgent pointer

   (ii) Six 1-bit flags

   (iii) Window size

7. *(a)* What is the purpose of fragment offset and time to live field in IP diagram? Explain.

   (b) A TCP machine is sending windows of 65535 bytes over a 1 Gbps channel that has a 10-millisecond one-way delay. What is the maximum through put achievable? What is the line efficiency?

8. Write short notes on any *two* of the following :

   (a) Modulation and encoding

   (b) Queuing theory

   (c) Telnet

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