Code : 051513

B.Tech. 5th Semester Exam., 2013

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 answers on any *seven* :

(a) Modulate the bit pattern, using 4-PSK technique. Given bit pattern is 10 01 10 10.

(b) What is CRC error detection scheme? Explain how such a scheme is most efficient for the action of burst errors.

(c) Compare the advantages and disadvantages of bus and ring topologies.

(d) Describe the FDDI frame format.

(e) How is Go Back n ARQ different from Selective Repeat ARQ?

(f) What are two-army problem and a three-way handshake?

(g) What signal-to-noise ratio is required to put T1 carrier on 50 kHz line?

(h) For the binary data 01101001, plot different digital shift keying modulated waveforms.

(i) What is World Wide Web?

(j) Explain the working of CSMA/CA and CSMA/CD protocol.

(k) Explain in brief the topologies that are used for broadcast type of communication.

2. *(a)* Consider five messages given by the probabilities 1/2, 1/4, 1/8, 1/16, 1/16. *(i)* Calculate H, *(ii)* Use the Shannon-Fano algorithm to develop an efficient code and for that code, calculate the average number of bits/message. Compare with H.

(b) Place the following concepts into correct layers of ISO-OSI reference model and justify your answer :

(i) Distributed document management

(ii) Error detection

(iii) Routing

3. *(a)* What is High-level Data Link Control Protocol? Discuss its importance in data communication. What are the different types of frames? Discuss briefly.

(b) Consider building a CSMA/CD network running at 1 Gbps over a 1 km cable with no repeaters. The signal speed in the cable is 200000 km/sec. What is the minimum frame size?

4. *(a)* Compare X.25 and TCP/IP. What are the principal strengths and weaknesses of each protocol?

   (b) A computer on a 6 Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 1 Mbps. It is initially filled to a capacity with 8 megabits. How long can the computer transmit at the full 6 Mbps?

5. *(a)* What is Link Control Protocol? Give the format of LCP packet. How authentication is supported in PPP? Explain.

   (b) Compare virtual circuit and datagram subnet. State the principles of congestion control and congestion prevention policies.

6. *(a)* Using RSA algorithm, encrypt and decrypt the message 'BE' with key pairs (3, 15) and (5, 15).

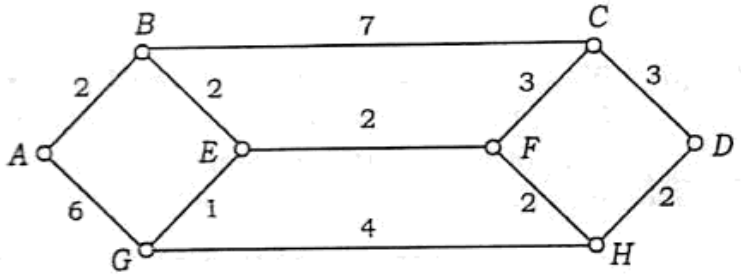
   (b) Television channels are 6 MHz wide. How many bits/sec can be sent if four levels digital signals are used? Assume a noiseless channel.

7. *(a)* Consider an error-free 64 kbps satellite channel used to send 512 byte data frames in one direction, with very short acknowledgement coming back the other way. What is the maximum throughput for window size of 01 and 07?

   (b) Explain the concept of tunneling in internetworking. Write down the differences in IPv4 and IPv6.

8. *(a)* Explain the working of User Datagram Protocol.

   (b) Using Dijkstra algorithm, find the shortest path from *A* to *D*.



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