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Name of Paper   : (CSHT–409) Data Communication and Computer Networks
Name of Course   : B.Sc. (Hons.) Computer Science
Semester   : IV   Maximum Marks : 75
Duration :   : 3 hours

(Write your Roll No. on the top immediately on receipt of this question paper.)

The paper has two Sections. All questions in Section A are compulsory. Attempt any four questions from Section B. Subparts of the questions should be answered together.

Section-A
(All Questions are compulsory)

Q. 1.(a) Draw the pulse diagram for bit stream 1110010100111, for the following encoding techniques [6]
   (i) RZ   (ii) Manchester   (iii) Differential Manchester

(b) Why are communication satellites in geosynchronous orbits? What is the prime advantage of [4]
   LEOS. [3]

(c) What do these special IP address denote:
   (i) 0.0.0.0
   (ii) 255.255.255.255   [3]
   (iii) 127.xx.yy.zz

(d) Write the port number of following protocols:
   FTP, TELNET, HTTP   [4]

(e) Differentiate between Adaptive and Non- Adaptive algorithms. Give Example of each? [4]

(f) What is window size, how pipelining property is used in sliding window protocols? [4]

(g) What is meant by Checksum and how is it useful in networks? [3]

(h). Give four characteristics of point to point protocol. [4]

(i) Find the minimum bandwidth for an FSK signal transmitting at 2000bps.Transmission is in [2]
   half-duplex mode and the carriers are separated by 3000HZ.

(j) What are two features of HTTP protocol   ? [2]

Section –B
(Attempt any four questions from section B)

Q.2. (a) Explain TCP protocol Header with the help of a diagram. [6]

(b) What are the minimum and maximum frame sizes for Ethernet frames? Why can't [4]
   the minimum frame length be zero .

Q.3. (a) Discuss the collision detection process in a CSMA/CD protocol can a station transmit and receive frames at the same time. [5]

(b) Briefly explain what is the important role of RPC in the communication network. [5]

Q.4. (a) What are the operational difference between ARP and RARP. [4]

(b) A router inside an organization receives a packet with the destination address 190.240.34.95. If the subnet mask is /19, find the subnet address. [2]

(c) How do multiple senders share the common transmission media in a network? List three techniques commonly used for this purpose. [4]

Q.5 Explain the differences between circuit switching and packet switching. How is virtual circuit approach different from datagram approach , briefly explain ? [10]

Q.6. (a) Explain following terms: [2*5]

- (i) Cladding
- (ii) Flow Control
- (iii) Flooding
- (iv) URL
- (v) BOOTP

Q.7. (a) The following character encoding is used in a data link protocol: [6]
A: 01000111; B: 1110001·1; FLAG: 01111110; ESC: 11100000 show the bit sequence Transmitted (in binary) for the four character frame: A B ESC FLAG when each of the following framing methods are used:

- (i) Character count
- (ii) Flag bytes with byte stuffing.
- (iii) Starting and ending flag bytes, with bit stuffing.

(b) Write any two functionalities for each of the following network devices: [2*2]

- (i) Switches
- (ii) Gateways