[This question paper contains 4 printed pages.]

Unique Paper Code   : 234403

Name of the Course   : **B.Sc. (H) Computer Science**

Name of the Paper   : Data Communication and Computer Networks (CSHT–409)

Semester   : IV

Duration : 3 Hours   Maximum Marks : 75

Instructions for Candidates

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

2. All questions in **Section–A** are compulsory.

3. Attempt **any four** questions in **Section–B.**

SECTION – A

(All questions are compulsory.)

1. (a) Explain which layer in the OSI model performs the following functions :

     (i) Route Determination

     (ii) Error Detection and Correction

     (iii) Interface to outside world

     (iv) Services such as e-mail and file transfer   (4)

   (b) What is the purpose of DF and MF bits in IPV4 Header ?   (2)

   (c) At what layer(s) do the following protocols operate in TCP/IP protocol ?

     (i) FTP

  (ii) ICMP

  (iii) DNS

  (iv) UDP   (4)

(d) How is Selective Repeat better than Go Back N ?   (3)

(e) Evaluate the maximum bit rate for a channel having bandwidth 1600 Hz if
    S/N ratio is 20db ?   (2)

(f) A constellation diagram consists of eight equally spaced points on a circle.
    If the bit rate is 4800 bps, what is the baud rate ?   (3)

(g) What is the frame format of PPP ?   (2)

(h) A receiver receives the vector 11001101111. Using the Hamming code
    algorithm, what was the original code sent.   (5)

(i) What are the different components of a URL ? Explain it.   (3)

(j) What is a loop back IP address ? How is it useful ?   (3)

(k) Write a short note on the following :

    (i) Peer to peer connection

    (ii) RPC   (2×2)

SECTION –B

*(Attempt any **four** questions from Section B)*

2. (a) What is the difference between flow control and congestion control ? Also
       specify the reason for occurrence of congestion in a network.   (7)

(b) What is meant by CRC ? How is it useful in networks ?   (3)

3. (a) What is Binary Exponential Back off algorithm in Ethernet ? How does it reduce the probability of collision in the Ethernet ?   (2+4)

(b) What is the format of IP datagram ?   (4)

4. (a) State and examine the distance vector routing algorithm. Briefly discuss the Count to Infinity problem.   (6)

(b) Describe the TCP connection establishment and release procedure.   (4)

5. (a) What do mean by data communication ? Write the characteristics on which effectiveness of data communication system depends.   (5)

(b) Define the following terms :

  (i) Unicasting

  (ii) Broadcasting

  (iii) Multicasting   (3)

(c) Write the short note on WWW.   (2)

6. (a) The network 134.122.0.0/16 has been subdivided into /19 networks.

  (i) How many /19 sub networks are there. Give their addresses.

  (ii) How many hosts can be on each network.

  (iii) Determine which network the IP address 134,122.67.124 belongs to.   (6)

(b) Explain the features of Datalink layer and Transport layer.   (4)

7. (a) Discuss the thick and thin Ethernet. (3)

    (b) How does DPCM differ from PCM ? What does adaptive DPCM do to achieve compression ? (4)

    (c) Draw a diagram showing A, B, C, D and E IP address formats. (3)