[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1509

Unique Paper Code : 42347610

Name of the Paper : Computer Networks

Name of the Course : **B.Sc. (Programme) DSE**

Semester : VI

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. The paper has **two** sections. **All** questions in **'Section A'** are compulsory.
3. Attempt any **five** questions from **'Section B'**. Parts of a question must be answered together.

SECTION A

1. (a) Explain MAN in computer network with example. (2)

   (b) Name the layer of the OSI model responsible for the following :

P.T.O.

(i) Providing interface to transmission media.

(ii) Providing interfaces for the end user. (2)

(c) Define a hyperlink. How can you create a hyperlink in a web page? (2)

(d) List any two problems with the TCP/IP reference model. (2)

(e) In which layer/s of the network reference model does the router operate? What is the main function of that layer/s? (2)

(f) How does the networking metrics **throughput** and **delay** help in calculating the performance? (3)

(g) List an advantage and disadvantage of star topology. How many links are required to connect k computers in a star topology? (3)

(h) To provide more reliability than a single parity bit can give, an error-detecting coding scheme uses one parity bit for checking all the odd-numbered bits and a second parity bit for all the even-numbered bits. What is the Hamming distance of this code? Explain your answer. (3)

(i) What is the purpose of cladding in an Optical fiber? How does a Single mode fiber differ from a Multi mode fiber? (3)

(j) A network has the IPv4 address 134.40.0.0. What class does this IP address belong to? Identify its subnet mask. How many hosts can this network support before subnetting. (3)

SECTION B

(Attempt any **five***)*

2. (a) What do you understand about service primitives? How can these four primitives can be used in a client-server environment for a request-reply Interaction? Explain. (6)

(b) What is the main difference between TCP and UDP? (4)

3. (a) What is the difference between half-duplex and full duplex transmission modes? Explain using diagrams and give examples of each. (6)

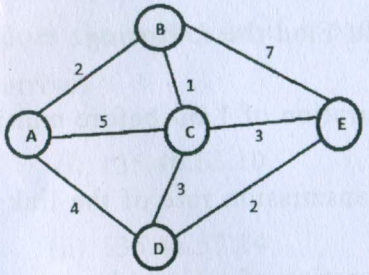
(b) What do you understand about Point-to-point connection and Multipoint connection? Give an example of each. Which one is better and why? (4)

4. (a) Compare Satellites with optical fibre as the communication medium. (6)

(b) Explain working of Low Earth Orbit (LEO) satellites in communication. (4)

5. (a) A bit stream 10011101 is to be transmitted using the standard CRC method. The generator polynomial is x^3+1. What is the actual bit string transmitted? Suppose the third bit from the left is inverted during transmission. How will the receiver detect this error? (6)

(b) Using Djikstra's shortest path algorithm, find the route from Router A to Router E given the following configuration. Show the working steps.



(4)

6. (a) A learning bridge connects a LAN segment with computers A, B and C to another LAN segment with computers P, Q and R. Show how the bridge learns the segment to which each computer is connected if the following sequence of frames are transmitted over the network.

- A sends to B
- B sends to A
- P broadcasts
- Q sends to A
- Q sends to P
- C sends to R
- R sends to P

(6)

(b) Four 1 kbps connections are multiplexed together. A unit is 1 bit. Find the following :

(i) The duration of 1 bit before multiplexing

(ii) The transmission rate of the link

(iii) The duration of a time slot

(iv) The duration of a frame (4)

7. (a) What are the four HTTP request types, and what does the server respond with when it receives the specific request type? When does a HTTP server return the status code 404? When does it return status code 400? (6)

(b) A router has the following (CIDR) entries in its routing table :

Address/mask	Next Hop
135.46.56.0/22	Interface 0
135.46.60.0/22	Interface 1
192.53.40.0/23	Router 1
default	Router 2

For each of the following IP addresses, what does the router do if a packet with that address arrives?

(i) 135.46.63.10

(ii) 135.46.57.14

(iii) 192.53.40.7

(iv) 192.53.56.7 (4)

8. (a) Define a noiseless channel and noisy channel used for network communication. List two protocols of each type and explain any one of them. (6)

(b) Define framing and the reason for its need. Explain one framing method with the help of an example. (4)

9. (a) Differentiate the following :

(i) Bus topology and Ring topology

(ii) Flow control and Error control (6)

(b) Specify the characteristics of the SMTP. (4)