

[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 1532-B F-7 Your Roll No.....

Unique Paper Code : 2513703

Name of the Paper : EL-DC-I-703 (Computer Networks)

Name of the Course : B.Tech. (Electronics) – Allied Course

Semester : VII

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on the receipt of this question paper.
2. Question No. 1 is compulsory.
3. Attempt any **four** questions out of the remaining **six**.
4. All questions carry equal marks.
5. Write answers of all parts of a question at one place only.
6. Calculator is not allowed.

1. Answer the following questions : (5×3)

- (a) Give two reasons for using layered protocols ? What is one possible disadvantage of having international standards for network protocols ?
- (b) Why is uplink frequency different from downlink frequency in Satellite Communication ?
- (c) Find the minimum Hamming distance for the following cases :
 - (i) Detection of two errors
 - (ii) Correction of two errors

P.T.O.

- (d) What is the difference between a port address, a logical address, and a physical address ?
 - (e) Compare and contrast a random access protocol with a controlled access protocol.
2. (a) Draw a schematic diagram, comparing different layers of the TCP/IP Model with the OSI Model. How are the Network Layer and Transport Layer different in two models ?
- (b) Differentiate between LAN, MAN and WAN.
- (c) Define the following terms :
- (i) Unicasting
 - (ii) Broadcasting
 - (iii) Multicasting
- (7+5+3)
3. (a) Differentiate between UTP and STP. How are they different from coaxial cables ?
- (b) Give three advantages and two disadvantages of using optical fibers.
- (c) What are Satellite networks ? What are the three types of orbits ?
- (5+5+5)
4. (a) What are the advantages and disadvantages of a connection-oriented service over connectionless service ? Give one example of each type of service.
- (b) A bit stream 10011101 is to be transmitted using the CRC method. The generator polynomial is 1001. Show the actual bit-string which is transmitted

after encoding. Suppose the third bit from the left is inverted during transmission. Determine whether this error is detected at the receiver end or not.

(c) Differentiate between the following :

(i) Go-Back-N ARQ Protocol and Selective Repeat ARQ Protocol

(ii) ARP and RARP (5+5+5)

5. (a) Define fragmentation and explain why the IPv4 and IPv6 protocols need to fragment some packets. The Protocol field used in the IPv4 header is not present in the fixed IPv6 header. Why not ?
- (b) Suppose that instead of using 16 bits for the network part of a class B address originally, 20 bits had been used. How many class B networks would there have been ? Can the value of the header length in an IPv4 packet be less than 5 ? When is it exactly 5 ?
- (c) ARP and RARP both map addresses from one space to another. In this respect, they are similar. However, their implementations are fundamentally different. In what major way do they differ ? (5+5+5)
6. (a) Explain Carrier Sense Multiple Access with Collision Detection. A network using CSMA/CD has a bandwidth of 20 Mbps. If the maximum propagation time (including the delays in the devices and ignoring the time needed to send a jamming signal) is $32.7 \mu\text{s}$ what is the minimum size of the frame ?
- (b) Differentiate between Repeaters, Hubs, Switches and Bridges. With respect to ISO-OSI model, name the layers in which these devices operate.
- (c) Explain why collision is an issue in a Random Access Protocol but not in Controlled Access or Channelizing Protocols. (7+5+3)

7. Write short notes on :

(a) Shortest Path Routing Algorithm

(b) Three types of Ethernet

(c) TCP Segment Header

(5+5+5)