

(iii) Expand the IPv6 address FDEC:74::B0FF:
0:FFF0

(c) What is World Wide Web? Draw its basic architecture and explain the uniform resource locator.

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1201

I

Unique Paper Code : 2513010007

Name of the Paper : Computer Networks

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

Semester : V

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. There are **seven** questions in all, out of which you have to attempt **five** questions.
3. **First** Question is compulsory
4. **All** questions carry equal marks.
5. Use of non-programmable Scientific Calculator is allowed.

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1. (6+6+6)

(a) Categorize the Star, Bus and Ring topologies in terms of line configuration. Given an input data stream as 010111. Sketch the following encoding schemes

(i) Manchester

(ii) AMI

(iii) Bipolar NRZ

(b) What is CSMA? Discuss the three persistence methods.

(c) Answer each of the following briefly :

(i) Give one similarity and one difference between OSI and TCP/IP reference Model.

(ii) The following character encoding is used in a data link protocol

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6. (6+6+6)

(a) Draw a labeled TCP Segment Header mentioning the bit numbers for each field. Explain the flags/bits of the control field.

(b) What is UDP and how is it different from TCP?

(c) What is FTP? Compare it with HTTP.

7. (6+6+6)

(a) Compare and contrast the fields in the main headers of IPv4 and IPv6. Make a table that shows the presence or absence of each field.

(b) Can the value of the header length in an IPv4 packet be less than 5? When is it exactly 5?

Write the following masks in slash notation(/n)

(i) 255.0.0.0

(ii) 255.255.240.0

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(b) Compare and Contrast the Go-Back-N ARQ with Selective-Repeat ARQ.

(c) Define Controlled Access and discuss briefly the three protocols in this category.

5.

(6+6+6)

(a) A block of addresses is granted to a small organization. One of the addresses is 198.16.37.39/28. What are the first address and the last address in the block? Also find the total number of addresses in the block.

(b) What is the difference between open loop congestion control and closed loop congestion control? Explain one mechanism of each kind.

(c) What is ARP and RARP? Explain.

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A: 01000111; B: 11100011; FLAG: 01111110; ESC: 11100000

Show the bit sequence transmitted in binary for the four-character frame: A B ESC FLAG using the framing method of "Flag Bytes with byte Stuffing"

(iii) Show the original (unabbreviated form of the following address)

0::0

(iv) Write the following in slash notation (/n)

255.255.224.0

(v) Find the net id and the host id of the following :

117.34.3.8

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- (vi) What port numbers are used by HTTP and FTP respectively?

2. (6+6+6)

- (a) Draw a schematic 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) What is signal impairment when it travels through transmission media and what are its causes? We need to send 260 kbps over a noise less channel with bandwidth of 20kHz. How many signal levels do we need?
- (c) Differentiate between Repeaters, Hubs, Switches and Bridges. With respect to ISO-OSI model, name the layers in which these devices operate.

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3. (6+6+6)

- (a) Briefly describe the services provided by the DLL. Distinguish between Bit and Byte stuffing.
- (b) A bit stream 10011101 is to be transmitted using the CRC method. The generator polynomial is x^3+1 . 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) How is guided media different from unguided media? Name the three main classes of guided media. What is the position of the transmission media in the OSI or the Internet Model?

4. (6+6+6)

- (a) What is the difference between a port address, a logical address, a physical address and a specific address?

P.T.O.