

Code: A-28**Subject: COMPUTER NETWORKS****Time: 3 Hours****June 2006****Max.****Marks: 100****NOTE: There are 9 Questions in all.**

- **Question 1 is compulsory and carries 20 marks. Answer to Q. 1. must be written in the space provided for it in the answer book supplied and nowhere else.**
 - **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
 - **Any required data not explicitly given, may be suitably assumed and stated.**
-

Q.1 Choose the correct or best alternative in the following: (2x10)

a. The _____ layer changes bits into electromagnetic signals.

(A) physical**(B)** data link**(C)** transport**(D)** none of **(A)**, **(B)** and **(C)**

b. _____ switching uses the entire capacity of a dedicated link

(A) circuit**(B)** message**(C)** virtual circuit**(D)** datagram

c. In an asynchronous TDM, for N signal sources, each frame contains M slots, where M is usually _____ N.

(A) equal to**(B)** greater than**(C)** less than**(D)** one less than

d. HDLC _____ field defines the beginning and end of a frame.

(A) flag**(B)** address**(C)** control**(D)** FCS

e. _____ is the access protocol used by the conventional Ethernet.

(A) CSMA**(B)** CSMA/CD**(C)** CSMA/CA**(D)** Token ring

f. Stations do not sense the medium during _____ time.

(A) RTS**(B)** CTS**(C)** SIFS**(D)** NAV

g. Which OSI layer corresponds to the IP layer?

- (A) physical (B) data link
(C) transport (D) network

h. In _____ ARQ, if a NAK is received, only the specific damaged or lost frame is retransmitted.

- (A) Stop and wait (B) selective repeat
(C) go-back-N (D) (A) & (B)

i. The VPI of an NNI is _____ bits in length.

- (A) 8 (B) 12
(C) 16 (D) 24

j. Digital signature can provide _____ for a network.

- (A) Authentication
(B) Integrity
(C) Non-repudiation
(D) All of the (A), (B) and (C)

Answer any FIVE Questions out of EIGHT Questions.

Each question carries 16 marks.

Q.2 a. Make a comparison of OSI reference model with TCP/IP reference model. (8)

b. Suppose two new devices are added to an existing 6 devices network. If the network has a mesh topology, how many new cable links are needed? How many new cable links will be needed if the network has a ring topology? (4)

c. With suitable diagrams and data organized in time slots, explain how synchronous TDM is different from asynchronous TDM. (4)

Q.3 a. Let 'X' bits of user data are to be transmitted over a K-hop path in a packet switched network as a series of packets, each containing 'P' data bits and 'h' header bits with $x \gg (p+h)$. The bit rate of the line is 'b' bps and the propagation delay is neglected. What value of 'P' minimizes the total delay? (5)

b. Explain the use of bit stuffing and byte stuffing. At which layer these functions are performed. (4)

- c. With suitable illustrations, explain selective repeat sliding window protocol. How is it better than Go-back-N protocol? **(5+2)**

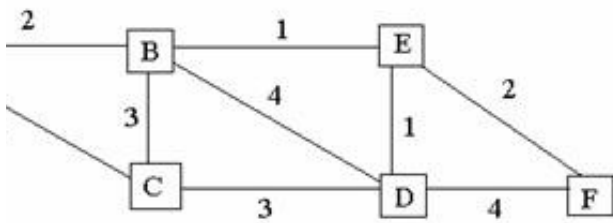
Q.4 a. Explain MAC sub layer protocol of 802.5 token ring network giving the details of frame format and ring maintenance. **(7)**

- b. Discuss the Aloha protocol. Suppose the ALOHA protocol is used to share a 56 kbps satellite channel. If the packets are 1000 bits long, find the maximum throughput of the system in packets per sec. **(5)**

c. What is CSMA/CD? Explain why CSMA/CD cannot be used for wireless LAN. **(4)**

Q.5 a. Discuss virtual-circuit packet switching with diagrams showing signalling message exchange and delays in virtual-circuit set-up. **(6)**

b. Find the shortest path frame A to D for the network shown. **(5)**



c. Define Little's formula and explain its significance. **(5)**

Q.6 a. What are the different classes of IP addressing? Discuss subnet addressing with an example. **(5+3)**

b. Explain the format of the Ipv6 basic header and the significance of extension headers in Ipv6. **(6+2)**

Q.7 a. Discuss the various fields in the ATM cell header for the UNI. **(8)**

b. A user wants to send an average of one cell every microsecond with the possibility of sending one cell every nanoseconds (ns) at the peak time. The user needs a guarantee of being able to send one cell every milliseconds (ms). If each cell takes 10 ms to reach destination, find the minimum allowable interval between cells, burstiness of the traffic and CID. **(4)**

c. Define various ATM service classes like VBR (Variable Bit Rate), UBR (Undefined Bit Rate), CBR (Constant bit rate), etc. **(4)**

- Q.8** a. Explain the basic ingredients of a conventional encryption scheme with a diagram. **(6)**
- b. Discuss SMTP standard for transferring mail between two hosts with the help of a typical mail flow diagram.
(7)
- c. Draw the general structure of HTTP messages. **(3)**
- Q.9** Write explanatory notes on **any TWO** of the following:
- (i) Real Time Transport Protocol (RTTP)
 - (ii) Multiprotocol Label Switching (MPLS)
 - (iii) FDDI
 - (iv) LAN bridges. **(2x8=16)**