Code: A-28 **Subject: COMPUTER NETWORKS**

December 2005

Time: 3 Hours

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. Which organization is responsible for development of LAN standards

(A) EIA. **(B)** ITU-T.
(C) ANSI. **(D)** IEEE.

b. Datagrams are

(A) addresses **(B)** connection less packet transfer
(C) file transfer technique **(D)** connection oriented packet transfer

c. Data link layer: frames, Network layer:_____

(A) packets **(B)** data units
(C) bits **(D)** files

d. File transfer protocol belongs to

(A) network layer. **(B)** application layer.
(C) datalink layer. **(D)** session layer.

e. In token ring, where is the token when a data frame is in circulation?

(A) At the receiving station **(B)** At the sending station
(C) Circulating in ring **(D)** None of the above

f. g (x) used in computing CRC is a

(A) function. **(B)** header.
(C) generator polynomial. **(D)** parity check equation.

g. 'Stop and wait' is an

(A) HTTP protocol **(B)** file transfer protocol
(C) ARQ protocol **(D)** application layer protocol

h. The frame control field in the MAC header is

(A) 10 bits **(B)** 12 bits
(C) 14 bits **(D)** 16 bits.

i. Bridges and gateways are

(A) routers **(B)** switches
(C) nodes **(D)** network components

j. What type of addressing is specifically used by the transport layer?

(A) Station address
(B) Network address
(C) Application program port address
(D) Dialog address

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Describe, with a diagram, the peer-to-peer communication in a layered computer network architecture. **(10)**

b. Distinguish between TCP/IP and OSI network models. **(6)**

Q.3 a. Discuss the packet switched, circuit switched and message switched networks from the point of view of signal transmission, routing, addressing and multiplexing. **(9)**

b. Describe the working of a statistical multiplexer in terms of Poisson process and derive an expression for average packet delay. **(7)**

Q.4 a. Describe the working of any two sliding window protocols. **(10)**

b. Consider the various combinations of communication channels with bit rates of 1 Mbps, 10 Mbps, 100 Mbps and 1 Gbps over links that have round-trip times of 10 ms, 1ms and 100 ms.

Find the delay bandwidth product for each of the 12 combinations of speed and distance. Which is the optimum channel among these? **(6)**

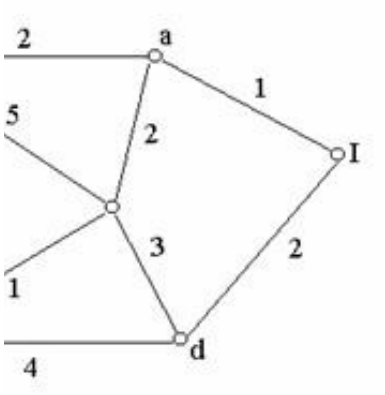
Q.5 a. When are MAC protocols preferred? **(4)**

b. S.T a slotted ALOHA technique is more efficient than a pure ALOHA. Justify the statement. **(8)**

c. A radio system uses a 9600 bps channels for sending call setup request messages to a base station. If the packets are 120 bits long, the time out is 20 ms and the backoff is uniformly distributed between 1 and 7. What is the maximum throughput possible with ALOHA and slotted ALOHA? **(4)**

Q.6 a. Discuss the IEEE 802.3 MAC frame structure. **(8)**

b. Find the shortest paths to all other nodes starting from node I. The weights shown are like costs. **(8)**



Q.7 a. Describe the general format of a Ip header. **(10)**

b. An IP datagram is to be fragmented. Which options in the option field need to be copied into the header of each fragment and which need only be retained in the first fragment? Justify the

handling of each option. **(6)**

Q.8 a. Describe with a neat diagram the BISDN reference model of an ATM network. **(10)**

b. Explain with an example, PNNI routing. How does it differ from Internet routing? **(6)**

Q.9 Write short notes on **any TWO** of the following:

(i) Overlay model.
(ii) Integrated services in Internet.
(iii) IEEE 802.11.
(iv) Session control protocols. **(2x8=16)**