

Code: AE-28

Subject: COMPUTER NETWORKS

JUNE 2007

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 topology requires a central controller or hub?
- (A) Mesh (B) Star
(C) Bus (D) Ring
- b. The physical layer is concerned with the transmission of _____ over the physical medium.
- (A) Programs (B) Dialogs
(C) Protocols (D) Bits
- c. Which multiplexing technique shifts each signal to a different carrier frequency?
- (A) FDM (B) TDM
(C) Both (A) & (B) (D) None of these.
- d. The local loop uses _____ cable that connects the subscriber telephone to the nearest switching office.
- (A) Twisted pair (B) Coaxial
(C) Fiber-optic (D) (B) or (C)
- e. In _____ ARQ, if ACK is not received, the damaged or lost frame is retransmitted.
- (A) Stop-and-wait (B) Go-back-N
(C) Selective repeat (D) Both (A) & (B)
- f. When a primary device asks a secondary device if it has data to send, this is called _____
- (A) Polling (B) Selecting
(C) Reserving (D) Backing off

- g. An 80 station traditional Ethernet is divided into four equal sized collision domains. This means that a maximum of _____ stations contend for medium at any one time.
- (A) 320 (B) 80
(C) 76 (D) 20
- h. Which of the following is defined in 802.11
- (A) LLC (B) PPP
(C) DCF (D) None of the above
- i. Which layer in ATM protocol reformats the data received from other networks?
- (A) Physical (B) ATM
(C) ATM adaptation (D) Cell transformation
- j. Class _____ has the greatest number of hosts per given network address.
- (A) A (B) B
(C) C (D) D

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

- Q.2** a. What are the essential elements or functions of a network architecture to achieve good and reliable communications? How are these functions organized into a layered structure? (6+1)
- b. Explain the encapsulation of PDUs in TCP/IP, and addressing with suitable diagrams. (5)
- c. Internet users are assumed to double every 18 months. If the number of users is 7 million in the year 1996, what will be the expected number of Internet users in the year 2008? (4)
- Q.3** a. 24 voice channels are to be multiplexed and transmitted over twisted pair. What is the bandwidth required for FDM? Assuming a bandwidth efficiency of 1 bps/Hz. What is the bandwidth required for TDM using PCM? (6)
- b. Make a critical comparison of communication switching techniques with the help of event timing diagram. (8)
- c. Define SDU and PDU. (2)

- Q.4** a. Explain stop-and-wait ARQ protocol with suitable diagrams when
(i) Frame is lost (ii) ACK is lost. (6)
- b. A channel has bit rate of 4 Kbps and a propagation delay of 20 msec. For what range of frame size does stop-and-wait protocol gives an efficiency of at least 50%? (6)
- c. What do you mean by multiple access communication? What is the role of MAC protocols? (3+1)
- Q.5** a. Differentiate between random access and scheduling approach to MAC. Discuss the basic reservation system of scheduling. (4+4)
- b. Explain Ethernet protocol with special reference to frame format. (8)
- Q.6** a. What is the need for ICMP? Explain with the format of ICMP. (2+4)
- b. Discuss the usefulness of extension headers in IPv6 with suitable figures. (6)
- c. Convert IP address whose hexadecimal representation is C22F1582 to dotted decimal notation? To what class does this address belong? (4)
- Q.7** a. What is the function of signalling? Discuss PNNI signalling with an example and suitable diagram. (1+8)
- b. Explain why each specific set of traffic descriptors and QoS parameters were selected for each of ATM service categories. (7)
- Q.8** a. What are block ciphers? Discuss DES encryption algorithm with a block diagram. (1+8)
- b. What are the key elements of a network management system? Explain with an example of distributed network management configuration. (2+5)
- Q.9** Write explanatory note on any **TWO** of the following:
- (i) Integrated services model.
 - (ii) MIME
 - (iii) CSMA/CA operation. (2 x 8=16)