Code: AE28 DECEMBER 2008 **Subject: COMPUTER NETWORKS**
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 among the following is correct?

IEEE 802.3 Standards	LAN configuration
a. 10Base5	1. Star LAN
b. 10Base2	2. Thinnet
c. 10BaseT	3. Twisted Pair Ethernet
d. 1Base5	4. Thicknet

The Options are

	a	b	c	d
(A)	2	4	1	3
(B)	4	1	3	2
(C)	4	2	3	1
(D)	2	3	1	4

b. Which of the following statements is false regarding a bridge?
(A) Bridge is a layer 2 device
(B) Bridge reduces collision domain
(C) Bridge is used to connect two or more LAN segments
(D) Bridge reduces broadcast domain

c. For a statistical time division multiplexer, there are four input message sources each with a bit rate of X_1 bps, X_2 bps, X_3 bps and X_4 bps and the output of is Y bps. Which among the following criterion satisfies the statistical TDM?
(A) $Y = X_1 + X_2 + X_3 + X_4$ **(B)** $Y >= X_1 + X_2 + X_3 + X_4$
(C) $Y <= X_1 + X_2 + X_3 + X_4$ **(D)** $Y = X_1 - X_2 + X_3 - X_4$

d. A sender is employing public key cryptography to send a secret message to a receiver. Which one of the following statements is **True**?
(A) Sender encrypts using receiver's public key
(B) Sender encrypts using his own public key
(C) Receiver decrypts using sender's public key

(D) Receiver decrypts using his own public key

e. Which one of the following statements is **False**?
(A) HTTP runs over TCP
(B) HTTP describes the structure of web pages
(C) HTTP allows information to be stored in a URL
(D) HTTP can be used to test the validity of a hypertext link

f. A subnet has been assigned a subnet mask of 255.255.255.192. What is the maximum number of hosts that can belong to this subnet?
(A) 14 **(B)** 30
(C) 62 **(D)** 126

g. In a data link protocol, the frame delimiter flag is given by 0111. Assuming that bit stuffing is employed, the transmitter sends the data sequence 01110110 as
(A) 01101011 **(B)** 011010110
(C) 011101100 **(D)** 0110101100

h. The bit error rate (BER) of an ATM stream is 10^{-5}. What would be the probability of an error in the payload assuming that the errors are uniformly distributed?
(A) 10^{-5} **(B)** $(48/53) \times 10^{-5}$
(C) $(5/53) \times 10^{-5}$ **(D)** Zero

i. Which among the following is correct?

Line coding Schemes	Applications
a. NRZ – L	1. Token Ring
b. Differential Manchester	2. ISDN
c. Manchester	3. RS - 232
d. 2B – 1Q	4. 10 Mbps Ethernet

The Options are

	a	b	c	d
(A)	3	1	2	4
(B)	3	1	4	2
(C)	2	1	4	3
(D)	2	4	3	1

j. Which among the following is correct?

Layers	Protocols / Algorithms
a. Data Link Layer	1. User Datagram Protocol
b. Transport Layer	2. CRC - 16
c. Network Layer	3. Trivial File Transfer Protocol
d. Application Layer	4. Address Resolution Protocol

The Options are

	a	b	c	d
(A)	3	1	2	4
(B)	3	1	4	2
(C)	2	1	4	3
(D)	2	4	3	1

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

Q.2 a. Explain the need for a protocol architecture and also describe the functionality of different layers in Seven-layered model? **(12)**

b. List the principles used in defining the OSI-layers. **(4)**

Q.3 a. Explain the Frame relay protocol architecture. **(6)**

b. List the characteristics of STDM. **(6)**

b. What is the principle of Datagram Packet Switching? **(4)**

Q.4 a. An ATM packet analyzer reads the contents of L field of AAL packet as follows. 1100 0011 0100 0010. The AAL protocol used is AAL ¾. Determine
(i) The number of ATM cells generated.
(ii) The size of the payload in bits.
(iii) The percentage overhead for the entire user data **(9)**

b. How long does it take to transmit an 8-inch by 10-inch image by facsimile over a B channel of ISDN facility? The facsimile digitizes the image into 300 pixels per inch and assigns 4 bits per pixel. **(7)**

Q.5 a. Draw the packet header format of Real Time Transport Protocol (RTP) and explain the significance of various fields. **(10)**

b. What do you understand by the Overlay model in Network Architecture? **(6)**

Q.6 a. How does the Address Resolution Protocol (ARP) map the IP address to the MAC address? **(8)**

b. Explain Internet Group Management Protocol with message format. **(8)**

Q.7 a. How the attacks on network security be categorized? Explain each one of them. **(6)**

b. Explain the following IP Utilities
(i) PING (ii) TRACEROUTE
(iii) IPCONFIG (iv) NETSTAT **(10)**

Q.8 a. Explain the vc-merging and non-vc merging for output streams in LDP. **(8)**

b. Explain the following differentiated services:-
(i) Traffic conditioner.
(ii) Bandwidth Broker. **(8)**

Q.9 a. Explain the concept of ALOHA protocol. Derive the expression for throughput of the same. How the throughput doubles in slotted ALOHA? **(12)**

b. What are the functions of Network Interface Card in LAN? **(4)**