Code: AE28 **Subject: COMPUTER NETWORKS**
Time: 3 Hours **Max. Marks: 100**

JUNE 2011

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.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
- **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 the best alternative in the following: (2×10)

a. The _____ layer changes bits into electromagnetic signals.

(A) Physical **(B)** Data link
(C) Transport **(D)** Application

b. The purpose of _____ is packet framing and error-detection functions that are AAL users require

(A) CPCS **(B)** SSCS
(C) SAR **(D)** None of the above

c. As the data packets moves from the upper to the lower layers, headers are _____ .

(A) Added **(B)** Removed
(C) Modified **(D)** Rearranged

d. A channel is extremely noisy for which the value of SNR is almost zero; then the channel capacity will be _____.

(A) Zero **(B)** 1
(C) 10 **(D)** 100

e. In TDM, the transmission rate of the multiplexed path is usually_____ the sum of the transmission rate of the signal sources.

(A) Greater than **(B)** Less than
(C) One less than **(D)** Equal to

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

(A) Address **(B)** Flag
(C) control **(D)** FCS

g. IP address in IPv6 consist of _____ bits.

(A) 128 **(B)** 32
(C) 4 **(D)** 64

h. In the _____ random access method, station do not sense the medium.

(A) Ethernet **(B)** ALOHA
(C) CSMA/CD **(D)** CSMA/ CA

i. Which type of switching uses a dedicated path? _____.

(A) Packet switching **(B)** Circuit switching
(C) Data gram process **(D)** Message switching

j. UDP and TCP are both_____ layer protocols.

(A) Data Link **(B)** Physical
(C) Transport **(D)** Network

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

Q.2 a. Describe the seven layer OSI reference model of a computer network with a diagram. Discuss the function of each layer. **(8)**

b. The Internet is roughly doubling in size every 18 months. If the number of hosts on the Internet in 1996 is 7 million, compute the expected number of Internet hosts in the year 2008. **(4)**

c. What is a multiplexer? Give a simple scheme to depict the multiplexing function. **(4)**

Q.3 a. A message is broken into three packets. Discuss the transmission of packets using circuit and packet switching with the help of event timing diagram. **(8)**

b. With suitable illustrations, explain selective repeat ARQ protocol. **(8)**

Q.4 a. Computer A uses stop and wait ARQ protocol to send packets to computer B, A & B are separated by a distance of 4000 kms.
(i) How long does it take computer A to receive acknowledgement for a packet?
(ii) How long does it take for computer B to receive a packet of size 1000 bytes if the throughput is 100 Mbps? Assume the speed to be the velocity of light.**(5)**

b. What is CSMA scheme? Discuss non-persistent, 1-persistent and p- persistent CSMA with suitable diagram. **(6)**

c. Explain why CSMA /CD cannot be used for wireless LANS? **(5)**

Q.5 a. A group of N stations share a 64 kbps slotted ALOHA channel. Each station outputs a 1000 bit frame on an average of once in every 100 secs. Find the maximum usable value of N. **(5)**

b. Explain the Bellman-Ford algorithm with an example. **(7)**

c. Explain the basics of a queuing system with the help of a queuing model. **(4)**

Q.6 a. Describe the format of the IP header for IPv4 with a diagram. **(8)**

b. How is subnet mask useful in IP addressing? Explain with an example. **(4)**

c. A class B network on the Internet has a subnet mask of $255 \cdot 255 \cdot 240 \cdot 0$. What is the maximum number of hosts per subnet? **(4)**

Q.7 a. Discuss the advantage of extension headers in the version IPv6 over IPv4. **(5)**

b. Discuss the following:
(i) ATM cells.
(ii) ATM service categories. **(4+4+3)**
(iii) Traffic descriptors.

Q.8 a. Draw the simplified model of conventional encryption and explain the five ingredients of the encryption scheme. **(6)**

b. With a diagram of the authentication header, explain the various fields. **(6)**

c. Write a note on digital signature. **(4)**

Q.9 a. Explain the features of the following data link controls:-
(i) HDLC
(ii) Point-to-point **(5)**

b. With the help of a block schematic, explain RSVP architecture. **(7)**

c. Write a note on RTP. **(4)**