Code: AE28   **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. Simplex, half-duplex and full-duplex are defined in

    (A) Line configuration   **(B)** Network Topology
    (C) Network Categories   **(D)** Transmission modes

b. The technique that provides higher bit rates in downstream direction (from telephone control office to subscriber site) than the upstream direction (from subscriber site to telephone control office) is used in

    (A) DMT   **(B)** ADSL
    (C) FDM   **(D)** DSL

c. Each packet is routed independently through the network in

    (A) Datagram   **(B)** Virtual Circuit
    (C) Switches   **(D)** Routers

d. In RSVP reservation request, _____ is used to set parameters in the node's packet scheduler and _____ specifies the set of packets that can use the reservation and is used to set parameters in the packet classifier.

    (A) Filterspec, Rspec   **(B)** filerspec,flowspec
    (C) flowspec, filterspec   **(D)** Rspec,filterspec

e. Multiplexing, framing structure and advance buffer allocation are features of

    (A) Service Specific Convergence Sublayer
    (B) Physical medium dependent Sublayer
    (C) Common Part Convergence Sublayer
    (D) Transmission Convergence Sublayer

f. Multicast address is used in

(A) Class C   (B) Class D
(C) Class E   (D) Class B

g. Temporary address called care-of address and permanent address called home address is used in

(A) Mobile IP   (B) DHCP
(C) Wireless LAN   (D) MAC Layer

h. In channels that have high error rates, _____ is inefficient because of more retransmissions.

(A) Sliding Window   (B) Stop and Wait
(C) Selective Repeat   (D) Go-Back N

i. The parameters, Target Token Rotation Time and Token Holding Times are used in

(A) Ethernet   (B) ATM
(C) FDDI   (D) B-ISDN

j. Neighbouring routers exchange routing table that state the set or vector of known distances to others destinations in

(A) Distance Vector Protocol   (B) Source Routing Protocol
(C) Link State Protocol   (D) Destination Routing Protocol

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

Q.2 a. Explain the functionality of physical layer, data link layer and network layer of OSI reference model.   **(9)**

b. Compare Integrated services IP and differentiated services IP in terms of their ability to protect themselves against theft of services.   **(7)**

Q.3 a. Describe various field of IPv6 header format.   **(5)**

b. IP address structure is divided into five classes. For each class, give the size of each field and number of hosts per network.   **(5)**

c. Explain subnetting. Give a tabular form to illustrate default mask for each class, IP address, example   for   each   class   and   the   corresponding   network address.   **(6)**

Q.4 a. Explain the following routing techniques:
(i) Deflection routing.
(ii) Shortest-path routing.   **(8)**

b. Give the comparison of following:

     (i) Static routing versus Dynamic routing.
     (ii) Link-State routing versus Distance-Vector routing.   **(8)**

Q.5   a. Explain the three persistence protocols that can be used with CSMA.   **(8)**

      b. Give IEEE 802.3 MAC frame format. **(4)**

      c. Mention various issues to be considered for bridges connected different LAN.   **(4)**

Q.6   a. Explain the following switching techniques:
      (i) Space Division Switching
      (ii) Time Division Switching   **(8)**

      b. Compare circuit switching, datagram packet switching and virtual-circuit packet switching.   **(8)**

Q.7   a. Explain the following ARQ protocols and also determine the optimum frame length that maximizes transmission efficiency by taking the derivatives and setting it to zero for each of it.
      (i) Stop-and-wait ARQ
      (ii) Go-Back N ARQ
      (iii) Selective Reject/Repeat ARQ   **(12)**

      b. Explain Point-to-Point protocol services and phase/transition states.   **(4)**

Q.8   a. Explain ATM cell header format for UNI and NNI.   **(6)**

      b. Can IP addresses be used in ATM? Explain why or why not?   **(4)**

      c. Explain the following ATM service categories:
      (i) Real time connections
      (ii) Non-real time connections.   **(6)**

Q.9   a. Give the equations used for plaintext and ciphertext in RSA Public-Key encryption. State the satisfactory requirements for RSA public key encryption algorithm.   **(5)**

      b. Explain various types of message authentication techniques.   **(6)**

      c. Describe the services provided by IPsec?   **(5)**