(2½ hours)

Total Marks: 75

N. B.: (1) **All** questions are **compulsory**.
    (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
    (3) Answers to the **same question** must be **written together**.
    (4) Numbers to the **right** indicate **marks**.
    (5) Draw **neat labeled diagrams** wherever **necessary**.
    (6) Use of **Non-programmable** calculators is **allowed**.

1. **Attempt *any two* of the following:**   **10**
a. What are the functions of the network and application layer in the OSI model?
b. Compare an IPv4 header with an IPv6 header.
c. How is the address space allocated for IPv6 addresses?
d. Explain the concept of subnetting in IPv4 with an example.

2. **Attempt *any two* of the following:**   **10**
a. Explain the cache control module and the cache table in the ARP package.
b. Explain the error reporting messages in ICMP.
c. Write a note on ATMARP.
d. State and explain the three phases that a mobile host goes through in order to communicate with a remote host.

3. **Attempt *any two* of the following:**   **10**
a. Explain the services provided by UDP.
b. Explain the control flags, window size and urgent pointer fields in the TCP header.
c. Explain the server state transition diagram for TCP.
d. Explain the UDP applications with respect to connection, error control with examples.

4. **Attempt *any two* of the following:**   **10**
a. Explain the DHCP client transition diagram.
b. Explain recursive resolution and iterative resolution used in Domain Name Service.
c. Explain the services provided by Stream Control Transmission Protocol.
d. Explain the association establishment in SCTP.

5. **Attempt *any two* of the following:**   **10**
a. Explain the four control characters used in TELNET for option negotiation.
b. Explain the following terms:- Dynamic document, Static document, hypertext, hypermedia, uniform resource locator
c. Write a note on :- HTTP
d. Explain the three attributes of communication over data connection in FTP.

6. **Attempt *any two* of the following:**   **10**
a. What is Simple Mail Transfer Protocol? Explain the scenario where both the sender and receiver are connected to the web servers via Lan or Wan
b. Explain POP3 and IMAP4.
c. Explain the two techniques used for traffic shaping to improve Quality of Service.
d. Explain the characteristics of real-time audio/video communication.

[TURN OVER]

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7. **Attempt _any three_ of the following:** 15
   a. Explain any two modules of the IPv4 package.
   b. State and explain the four types of links in OSPF?
   c. What are the different timers used in TCP?
   d. Explain the following used in Domain Name Service:- Partially Qualified Domain Name, Label, Zone, Root Server, Primary Server
   e. Write a note on cookies used with HTTP.
   f. State and explain the different types of messages in BGP.

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