

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.

Q1. Attempt any three.

(15)

- What is data communication? State and explain four fundamental characteristics of data communication.
- Explain baseband transmission.
- Explain various ways of calculating data rate.
- Explain 4B/5B block coding.
- Explain various types of network.
- Explain Amplitude Shift Keying.

Q2. Attempt any three.

(15)

- State and explain advantages and disadvantages of optical fibre.
- What is checksum? Explain with example.
- Explain space division switch.
- A host with IP address 130.23.3.20 and physical address OxB23455102210 has a packet to send to another host with IP address 130.23.43.25 and physical address OxA46EF45983AB. The two hosts are on the same Ethernet network. Show the ARP request and reply packets encapsulated in Ethernet frames.
- Explain Frequency Division Multiplexing.
Five channels, each with a 100-kHz bandwidth, are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 10 kHz between the channels to prevent interference?
- Explain various components in packet switched networks.

Q3. Attempt any three.

(15)

- Explain encoding schemes for Fast Ethernet.
- Explain operation of cellular telephony.
- Explain the services of 802.11.
- Write short note on CSMA/CD.
A network using CSMA/CD has a bandwidth of 10 Mbps. If the maximum propagation time (including the delays in the devices and ignoring the time needed to send a jamming signal, as we see later) is 25.6 μ s. what is the minimum size of the frame?
- Explain PPP frame format.
- Explain layers in Bluetooth.

Q4. Attempt any three.

(15)

- Given an IP address 70.12.100.132 and Network Mask 255.255.255.192. Find the following:
 - Network address
 - Broadcast address

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- b. Explain the transition state in DHCP.
 - c. Explain various timers in RIP.
 - d. Explain IPv6 header format.
 - e. Explain various options in IPv4.
 - f. What is the responsibility of IPv4? Solve the following:
 - (i) A packet has arrived with an M bit value of 1. Is this the first fragment, the last fragment, or a middle fragment? Do we know if the packet was fragmented?
 - (ii) In an IPv4 packet, the value of HLEN is 5, and the value of the total length field is (0028)16. How many bytes of data are being carried by this packet?

Q5. Attempt any three.

(15)

- a. Explain Go Back N Protocol.
- b. Explain three way handshake in TCP.
- c. Explain architecture of WWW.
- d. Explain various SMTP commands in process of email delivery.
- e. Explain various types of resolution in DNS.
- f. The content of UDP header in hexadecimal format is **CB84000D001C001C**. Answer the following:
 - (i) What is the source port number?
 - (ii) What is the destination port number?
 - (iii) What is the total length of user datagram?
 - (iv) What is the length of data?
 - (v) Is the packet directed from client to server or vice versa?