

Time: 3 hours

Max. Marks: 80

- N.B. : (1) Question No.1 is compulsory
 (2) Answer any three questions from Q. 2 to Q.6.
 (3) Draw a neat diagram if necessary.

- Q1 Solve any four**
- a Draw OSI reference model. List the hardware devices, functions and protocols at each layer. **5**
 - b Compare IPv4 and IPv6 **5**
 - c Explain Three-Way Handshaking for connection establishment in TCP **5**
 - d Compare Star, Mesh, and Bus Topology **5**
 - e An ISP grants a block of 195.2.6.0/24 addresses. It is required to have 14 subnets. Determine the i) slash notation, ii) subnet mask, ii) first usable IP address and broadcast address belonging to first subnet. **5**
- Q2**
- a Explain the principles of circuit switching and packet switching. Compare circuit switching and packet switching **10**
 - b Compare twisted pair, coaxial and optical fibre cables. State at least one advantage and drawback of each cable. **10**
- Q3**
- a Explain the HDLC frame format with a neat diagram. Explain HDLC bit stuffing and destuffing. **10**
 - b Draw IPV4 Header and explain the meaning of various fields associated with it **10**
- Q4**
- a Explain why IP uses ICMP? State ICMP message types and explain with neat diagrams. **10**
 - b Differentiate between TCP and UDP. The following is the dump of the UDP header in hexadecimal format. **10**
- 0045DF0000500000
- a. What is the source port number?
 - b. What is the destination port number?
 - c. Is the packet directed from the client to the server or vice versa?
 - d. State which transport layer protocols would be necessary for each of the following applications
 DNS, DHCP, File Transfer, Web Browsing, and remote login
- Q5**
- a Explain pure ALOHA and slotted ALOHA with neat diagrams. Also compare pure and slotted ALOHA. **10**
 - b raw and explain TCP segment header. The following is a dump of a TCP header in hexadecimal format **10**
- 053200016 0000000F 00000000 700207FF 00000000**
- 1) What is the source port number?
 - 2) What is the destination port number?
 - 3) What is sequence number?
 - 4) What is the acknowledgement number?
 - 5) What is the length of the header?
- Q6 Write a short note on (Solve any 2)** **20**
- a DHCP
 - b Unicast routing protocols
 - c DNS
