

- 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.

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- 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
