Time: 3 Hours **Marks: 80**

NOTE: 1. Question no. one is compulsory.
2. Attempt any three questions out of reaming five questions.
3. Each question carries 20 marks.

Q.1 Attempt any four questions out of five questions. 20m

a. Compare star, bus and mesh Topology.
b. Explain design challenges in physical layer of OSI reference model.
c. Explain in detail BGP routing.
d. Draw and explain TCP Header.
e. Compare Telnet and SSH.

Q.2 a Analyze CSMA-CA protocol in terms of collision avoidance. 10m

b. Explain TCP/IP Model with functions of each layer. State its advantages and limitations. 10m

Q.3 a. The following is the content of UDP header in hexadecimal format 5m

CB84000D001C001C

1. What is source port number?
2. What is the destination port number?
3. What is the total length of user datagram?
4. What is the length of data?
5. Is the packet directed from client to server or vice versa?

b. Analyze how slotted ALOHA gives better throughput that pure ALOHA. 5m

c. Explain HTTP protocol in detail. 5m

d. Describe HDLC bit stuffing and destuffing. 5m

Q.4 a. An ISP is granted a block of addresses starting with 190.100.0.0/16. The ISP need to Distribute these addresses to three groups of customers as follows: 10m

1. The first group has 64 customers: each need 256 addresses.
2. The second group has 128 customers: each need 128 addresses
3. The third group has 128 customers: each need 64 addresses. Design the sub blocks and find out how many addresses are still available after these allocations.

b. Explain how a connection is established, data transfer and connection termination happens in TCP using three-way handshaking. 10m

Q.5 Explain each field in IPv4 datagram format. Also compare IPv4 and IPv6. 10m

b. Analyze different types of ARQ methods. 10m

Q.6 Write a short note on any four from the following: 20m

a. Internet Control Message Protocol (ICMP)
b. Link state routing algorithm
c. Congestion control in transport layer
d. OSPF routing protocol
e. DSL-Broadband standard

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