



[Time: 3 hrs]

[Marks: 80]

- N.B:**
1. Question No.1 is compulsory.
 2. Assume suitable data if necessary.
 3. Attempt any three questions from remaining questions.

- Q.1**
- a) Explain design issues of layers. Explain ISO OSI reference model with diagram. 10
 - b) Explain design issues of Data Link layer. Explain Sliding Window protocol Selective Repeat. 10
- Q.2**
- a) Explain with diagram the relationship between Protocol, Interface and Service. 05
 - b) Explain Repeater, Hub, Bridge, Switch Gateway. 05
 - c) Describe TCP header with diagram. 10
- Q.3**
- a) Explain different framing methods? What are the advantage of variable length frame over fixed layer frame. 10
 - b) Describe IPV4 header format with diagram. 10
- Q.4**
- a) Classify transmission media and compare them. 10
 - b) Explain Distance vector routing protocol. What is count to infinity problem How to overcome it? 10
- Q.5**
- a) Explain Channel allocation problem. Explain CSMA/CD protocol. A network with CSMA/CD has 10 Mbps bandwidth and 25.6 ms maximum propagation delay. What is the minimum frame size? 10
 - b) Explain Congestion control. Explain leaky bucket algorithm 10
- Short note on (any 4) 20**
- a) HDLC
 - b) Network Address Translation (NAT)
 - c) Berkeley Sockets
 - d) ARP
 - e) ICMP
 - f) DNS
 - g) SMTP
