



Time Allotted : 3 Hours

Full Marks : 70

The Figures in the margin indicate full marks.

Candidate are required to give their answers in their own words as far as practicable

**Group-A (Very Short Answer Type Question)**

1. Answer any ten of the following :

[ 1 x 10 = 10 ]

- (I) The two parameters used for measuring the performance of a network are –  
a) throughput and delay    b) power and delay    c) power and throughput    d) throughput and buffer size
- (II) Which is not a basic multiplexing method?  
a) FDM    b) TDM    c) WDM    d) IMUX
- (III) An IPv4 address consists of ..... bits.  
a) 48    b) 16    c) 32    d) 128
- (IV) \_\_\_\_\_ loop congestion control is a congestion prevention mechanism.  
a) close    b) open    c) slow-start    d) fast-retransmission
- (V) Which protocol in the application layer provides name services?  
a) SMTP    b) DNS    c) HTTP    d) SNMP
- (VI) DES encrypts blocks of \_\_\_\_\_ bits.  
a) 32    b) 56    c) 64    d) 128
- (VII) Which topology requires a central controller or hub?  
a) mesh    b) star    c) ring    d) bus
- (VIII) A telephone network is an example of ..... network.  
a) packet-switched    b) circuit-switched    c) message-switched    d) none of the above
- (IX) Identify the class of IP address 199.1.2.3.  
a) class A    b) class B    c) class C    d) class D
- (X) In QoS techniques, packets wait in a buffer (queue) until the node is ready to process them in  
a) out-of-order ones    b) first-in-first out    c) last-in-first out    d) first-in-last out
- (XI) Which of the following is true?  
a) FTP allows systems with different directory structures to transfer file.  
b) FTP allows systems using ASCII and a system using EBCDIC to transfer file.  
c) FTP allows a PC and SUN workstation to transfer files.  
d) All of these are true.
- (XII) A digital signature is  
(a) a bit string giving identity of a correspondent  
(b) a unique identification of a sender  
(c) an authentication of an electronic record by tying it uniquely to a key only a sender knows  
(d) an encrypted signature of sender

**Group-B (Short Answer Type Question)**

Answer any three of the following :

[ 5 x 3 = 15 ]

2. Briefly compare between LAN and MAN with example. [5]
3. Compare between TCP/IP and OSI model (mention at least 5 points) [5]
4. Explain Path vector routing with an example. [5]
5. How does Leaky bucket algorithm improve the quality of service in computer networking? [5]
6. A channel has a signal-to-noise ratio of 63 and a bandwidth of 1 MHz. What are the appropriate bit rate and signal level? [5]

**Group-C (Long Answer Type Question)**

Answer any three of the following :

[ 15 x 3 = 45 ]

7. (a) For n devices, give an estimate of the number of cable links required for a mesh, bus and star topology. [ 5 ]

- (b) What are the different performance criteria that needs to be considered to make a network effective and efficient? [ 5 ]
- (c) Give two examples each for simplex, half-duplex and full-duplex mode of data communication. [ 5 ]
8. (a) Write the importance of layered architecture in computer network. [ 3 ]
- (b) Discuss the different addresses (MAC, IP and port) associated with computer network with respect to the layer they are associated with and the role they play in the overall transfer of data from source to destination in computer network. [ 6 ]
- (c) For a multipoint connection the Data Link layer is often sub-divided into two sub-layers. Discuss the two sub-layers and their individual functionalities. [ 4 ]
- (d) Protocols form a virtual connection between the corresponding layers of source and destination. Discuss the significance of the statement. [ 2 ]
9. (a) Briefly describe IPv4 header fields. [ 5 ]
- (b) What do you mean by unicasting, multicasting and broadcasting? [ 4 ]
- (c) Explain the Link State Routing algorithm with an example. [ 6 ]
10. (a) Explain with diagram how TCP does congestion control using slow start, additive increase and multiplicative decrease mechanisms. [ 6 ]
- (b) Explain why TCP is connection-oriented and UDP a connectionless protocol. [ 5 ]
- (c) Explain how Token bucket algorithm improves the quality of service by crediting an idle host. [ 4 ]
11. (a) What do you mean by 'terminal network'? How are options negotiated in TELNET? How are control and data characters distinguished in NVT? [ 3+3+3 ]
- (b) Describe the working principle of SNMP in brief. [ 6 ]

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