CS/B.Tech(IT)/SEM-6/IT-603/2010

2010

DATA COMMUNICATION & NETWORKING

Time Allotted : 3 Hours   Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

    i)   If a TDMA network has eight stations, the medium
         bandwidth has .... bands.

         a)   16   b)   8

         c)   4   d)   1.

    ii) In an optical fibre, the inner core is .... the
         cladding.

         a)   denser than   b)   less dense than

         c)   the same density as   d)   another name for.

    iii) Which of the following is true ?

         a)   FTP allows systems with different directory
              structures to transfer file.

         b)   FTP allows a system using ASCII and a system
              using EBCDIC to transfer file.

         c)   FTP allows a PC and a SUN workstation to transfer
              files.

         d)   All of these are true.

6202   [Turn over

iv) The hamming code is a method of

a) error detection   b) error correction

c) error encapsulation   d) both (a) and (b).

v) In the string 219.46.123.107, what is the network address of the host we are looking for ?

a) 219.46.123.0   b) 107.123.0.0

c) 107.123.46.0   d) 107.0.0.0

vi) Connection establishment involves a .... handshake.

a) one-way   b) two-way

c) three-way   d) none of these.

vii) Given the IP address is 180.25.21.172 and the subnet mask 255.255.192.0, then what is the subnet address ?

a) 180.25.21.0   b) 180.25.0.0

c) 180.25.8.0   d) 180.0.0.0

viii) A bridge has access to the .... address of a station on the same network.

a) physical (MAC)   b) network

c) service access point   d) all of these.

ix) For Stop and Wait ARQ, for n data packets sent, ... acknowledgements are needed.

a) n b) $2n$

c) $n - 1$ d) $n + 1$.

x) Which of the following is an interior routing protocol ?

a) RIP   b) OSPF

c) BGP   d) both (a) and (b).

GROUP – B
(Short Answer Type Questions)
Answer any *three* of the following.   3 × 5 = 15

2. Compare star and mess topology with advantages and disadvantages.

3. What is IP address ? Compare classful address and classless address.   2 + 3

4. What do you mean by Data transparency and Bit stuffing ? Why is bit stuffing needed ?   3 + 2

5. Explain distance vector routing with an example.

6. Why do we need a DNS system, when we can directly use an IP address ? What is the purpose of the inverse domain ?   3 + 2

GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following.   3 × 15 = 45

7. a) The code 11110101101 was received. Using the Hamming encoding algorithm, what is the original code sent ?

    b) Given a 10 bit sequence 1010011110 and a divisor of 1011, find the CRC. Check your answer.

    c) A channel has a data rate of 4 kbps and propagation delay of 20 ms. For what range of frame size does top-and-wait give an efficiency of at least 50% ?   4 + 5 + 6

8. a) Briefly explain modes of data communication in a network.

   b) What is QAM ? Why is it better than PSK ?

   c) Why digital-to-digital encoding is required ? Explain Manchester and diff. Manchester encoding techniques. 5 + 4 + 6

9. a) Briefly describe IP$_{v4}$ header fields.

   b) What do you mean by unicasting, multicasting and broadcasting ?

   c) What are the differences between Distance Vector Routing and Link State Routing ? 6 + 4 + 5

10. a) What do you understand by message security ? Explain the terms : 'User Authentication', 'Key Management' and 'Security Protocols'.

    b) How does Licky bucket congestion control algorithm work ?

    c) "TCP and UDP" — which one is better ? Justify your answer. 6 + 4 + 5

11. Write short notes on any *three* of the following : 3 × 5

    a) Circuit switching

    b) ICMP

    c) E-mail

    d) CRC

    e) DNS

    f) Cryptography.