CS/MCA/SEM-2/MCA-201/2013

2013

DATA COMMUNICATION & COMPUTER NETWORK

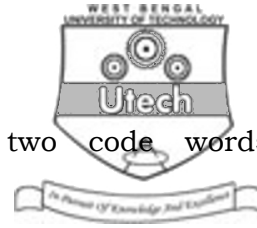*Time Allotted* : 3 Hours   *Full Marks* : 70

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)   Which company developed the TCP/IP protocol for networking ?

   a)   IBM   b)   DEC

   c)   DARPA   d)   NOVELL.

   ii)   The Hamming code is a method of

   a)   error correction   b)   error detection

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

   iii)   Flow control is used to prevent

   a)   overflow of sender buffer

   b)   overflow of receiver

   c)   collision between sender and receiver

   d)   underflow of sender and receiver.

iv) Hamming distance between the two code words 10010101 and 00100111 is

a) 4   b) 5

c) 10110010   d) 11001011.

v) Virtual circuit switching is a form of

a) Datagram switching   b) Message switching

c) Packet switching   d) Circuit switching.

vi) Which of the following TCP/IP protocols allows an application program on one machine to send a datagram to an application program on another ?

a) RARP   b) ARP

c) TCP   d) FTP.

vii) ARQ stands for

a) Automatic Repeat Quantization

b) Automatic Repeat Request

c) Automatic Retransmission Request

d) Acknowledge Repeat Request.

viii) Manchester encoding is .... encoding.

a) return to zero   b) non-return to zero

c) return to one   d) none of these.

ix) ALOHA

a) is used for channel allocation problem

b) is used for data transfer

c) is used for buffering

d) all of these.

x) TCP is a/an

a) reliable connection oriented protocol

b) unreliable connection oriented protocol

c) reliable connection-less protocol

d) unreliable connection-less protocol.

GROUP – B

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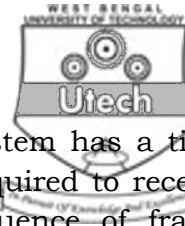
Answer any *three* of the following   3 × 5 = 15

2. Differentiate between Circuit Switching and Packet Switching.

3. A generator function for CRC is $X^5 + X^2 + 1$.

   a) What is the generator function in binary form ?

   b) What is the checksum for the message 1101011011 in binary form ?   2½ + 2½

4. Briefly explain the importance of Multiplexing. Discuss the difference between TDM and FDM.   2 + 3

5. How to convert a Digital signal to an Analog signal ? Compare between ASK and FSK.   2 + 3

6. What are Baud rate and Bit rate ? Establish the relationship between these two.   2 + 3

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following.   3 × 15 = 45

7. a) How CSMA provides a clear improvement over ALOHA ?

   b) How CSMA indicates further improvement by implementing CSMA/CD ?

   c) Explain the function of a token ring ?

   d) Explain how a receiver acknowledged a frame in token ring ?   4 + 4 + 5 + 2

8. a) What do you understand by the term 'Data Security' ?

   b) Explain the various aspects of security with the help of private and public keys.

   c) Explain RSA method with an example.   4 + 6 + 5

9. a) Suppose that a stop and wait ARQ system has a time out value that is less than the time required to receive an acknowledgement. Sketch the sequence of frame exchanges that transpire between two stations when station *A* sends five frames to station *B* and no errors occur during transmission. 7

b) Draw and explain the *I* frame and *U* frame in HDLC. 4

c) Why do LANs tend to use broadcast networks ? Why do we not use networks consisting of multiplexers and switches.

2 + 2

10. a) Discuss the different steps of Distance Vector Routing. 5

b) Explain the frame format of 802·5 LAN. How does FDDI differ from 802·5 LAN ? 3 + 2

c) "Data Link layer ensures delivery within the same physical network, but transport layer ensures delivery within the networks." Explain. 5

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

a) DQDB

b) Piggybacking

c) GEO satellite

d) Domain Name System

e) *X*·25 protocol.

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