



Name :
Roll No. :
Invigilator's Signature :

**CS/MCA/SEM-2/MCA-201/2012
2012**

DATA COMMUNICATION & COMPUTER 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.*

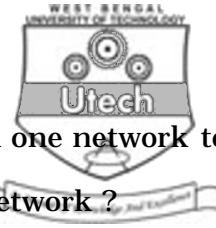
GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

10 × 1 = 10

- i) 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 of the following allows devices on one network to communicate with devices on another network ?
- a) Multiplexer
 - b) Gateway
 - c) Switch
 - d) Modem.
- iii) In HDLC insert a 0 bit after consecutive 1 bits in the message data.
- a) 4
 - b) 6
 - c) 5
 - d) 7.
- iv) Pure ALOHA has a maximum efficiency of
- a) 18%
 - b) 37%
 - c) 10%
 - d) none of these.
- v) ARP is used to find
- a) IP address
 - b) MAC address
 - c) Subnet address
 - d) Host address.



- vi) X.25 protocol consists of
- a) physical and frame level
 - b) frame and packet level
 - c) physical, frame and packet level
 - d) none of these.
- vii) IP address in the B-class is given by
- a) 125.123.123.2
 - b) 191.023.21.54
 - c) 192.128.32.56
 - d) 10.14.12.34
- viii) The main function of Transport layer is
- a) node to node delivery
 - b) process to process delivery
 - c) synchronization
 - d) updating and maintenance of routing tables.



ix) If the baud rate is 400 for a 4-PSK signal, the bit rate is

- a) 100 bps b) 400 bps
c) 800 bps d) 1600 bps.

x) In a Go-Back-N ARQ, if the window size is 63, what is the range of sequence number ?

- a) 0 — 63 b) 0 — 64
c) 1 — 63 d) 1 — 64.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What is SNR ? How can you identify the noiseless and noiseless channels using SNR ? What is Nyquist Bit rate of noiseless channel ? 1 + 2 + 2
3. What is the need of modulation ? What are the different conversion techniques to analog signal to digital data ? 1 + 4
4. Compare and contrast link-state and distance vector routing.
5. What is the difference between a port address, logical address and a physical address ?
6. Compare AM, FM and PM with example.



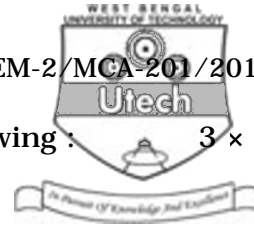
GROUP - C
(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What procedure is used to prevent a stream of binary data being misinterpreted as an HDLC flag ? Explain the operation of this procedure. 4
- b) In stop-and-wait flow control, define and discuss the handling of a
- i) damaged frame and a
- ii) lost frame. 5
- c) Apply CRC algorithm, determine the checksum and the transmitted frame for the bit stream 1101011011 and for the generator polynomial $X^3 + X^2 + 1$. 6
8. a) What is switching ? Compare the different types of switching technique. 4
- b) What is the difference between IPV4 and IPV6 ? 2
- c) What is the difference between TCP and UDP ? 2



- d) What are classfull and classless addressing ? What is subnet musk ? Show each of default subnet mask of classfull addressing. 3
- e) Compare the devices repeater, router, bridge and gateway. 4
9. a) What do you mean by congestion control ? Explain the concept of token bucket in controlling congestion. 2 + 5
- b) Using Manchester and differential Manchester line encoding techniques encode the following binary strings :
- i) 11010100010
- ii) 01011011011. 4 + 4
10. a) What do you understand by data security ? Explain the various aspects of security with the help of public and private key. 2 + 4
- b) Explain digital signature for authentication with diagram. 6
- c) Differentiate between connection oriented and connectionless services implemented by the network layer. 3



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

- a) Safe IP
- b) Public key and Private key
- c) Circuit switched and packet switched networks
- d) 802.3 LAN
- e) X.25 protocol.

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