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 noiseful 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 × 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.