MCA 4th Semester Examination, 2013

COMPUTER NETWORKS

PAPER — 404

Full Marks : 100

Time : 3 hours

Answer **Q.No. 1** and any **four** from the rest

The figures in the right hand margin indicate marks

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

Illustrate the answers wherever necessary

1. Answer any *five* questions :   2 × 5

   (*a*) What do you mean by composite signal ? Give example.

   (*b*) Differentiate between low pass and band pass channels.

(c) State Nyquist bit rate theorem for a noiseless channel to get the theoretical maximum capacity.

(d) Compute the baud rate for a 72000 bps 64-QAM signal.

(e) What is inverse multiplexing ?

(f) What is the purpose of providing two separate protocols UDP and TCP in the transport layer of TCP/IP architecture.

(g) Differentiate between active and dynamic pages.

2. (a) List the layers of TCP/IP reference model and briefly describe the responsibilities of each layer. 10

(b) What do you mean by connection-oriented services ? How connectionless services differ with that ? 2 + 3

3. (a) "The bit rate is proportional to the bandwidth of a signal." — Justify with example. 5

(b) A signal travels through a transmission medium and its power is reduced to half. Compute the power-loss in dB. 3

(c) Briefly describe bipolar line encoding technique. Why it is superior than polar encoding technique ? 5 + 2

4. (a) Why analog to analog modulation is required ? Briefly describe how the carrier signal is modulated with modulating signal, with proper diagram. 2 + 3

(b) Why bit-padding is sometimes necessary in multiplexing ? 3

(c) Construct the Hamming code for the bit sequence 10011101. 7

5. (a) With proper diagram, briefly explain how the loss of a frame is handled by stop-and-wait ARQ. 5

(b) State the two common modes of transmission of HDLC. Briefly describe the frame format of information frame in this concern. 2 + 5

    (c) Why and how HDLC uses bit-stuffing ?   3

6. (a) What is the purpose of subnetting ?   2

    (b) Find the host id of 19·34·21·5.   1

    (c) A network has subnet mask 255·255·255·224, determine the maximum number of host in this network.   2

    (d) Suppose a system uses Go-Back-N- ARQ protocol with window size 3. If a sender want to transmit 6 frames and every 4-th frame is error, then calculate how many number of extra frames to be transmitted to the receiver.   5

    (e) Find the expressions for average delay and throughput for both pure ALOHA and slotted ALOHA.   5

7. (a) "MIME is not a mail protocol, it is only an extension to SMTP." – Justify.   3

    (b) How the actual mail transfer is done through MTA ?   5

(c) What is POP3 ? How does it differ with IMAP4 ? 2 + 2

(d) Describe the basic components of URL. 3

8. Write short notes on any *three* : 5 × 3

(i) FTP

(ii) Bridge

(iii) Fibre Optic Channel

(iv) CSMA.

[*Internal Assessment* : 30 Marks]