

**2017****MCA****4th SEMESTER EXAMINATION****NETWORKING****PAPER—MCA-404***Full Marks : 100**Time : 3 Hours**The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Illustrate the answers wherever necessary.**Answer Q. No. 1 and any four from the rest.*

1. Answer any *five* questions : 5×2
- (a) A periodic signal has a bandwidth of 20Hz. The highest frequency is 60Hz. Draw the spectrum if the signal contains all integral frequencies of the same amplitude.
- (b) What is the purpose of a guard band in modulation techniques ?

*(Turn Over)*

- (c) Consider a noiseless channel with a bandwidth of 3000Hz transmitting a signal with four signal levels. Calculate the maximum bit rate.
- (d) The following block of 16 bits is to be sent using checksum of 8 bits :  
10101001 00111001  
Determine the pattern to be sent.
- (e) What is the advantage of controlled access over random access ?
- (f) How does a repeater differ from an amplifier ?
- (g) What is the maximum number of subnets in class B for the following subnet mask ?  
255.255.192.0

2. (a) Briefly describe the layered architecture of ISO/OSI reference model, and compare with TCP/IP Model.
- (b) Differentiate between a low pass and a band pass channel.
- (c) What are the advantages of star topology over ring topology ? 10+3+2
3. (a) A signal has four data levels with a pulse duration of 2ms. Calculate the bit rate.

(b) Consider the following data byte : 01001110.  
Use RZ encoding technique to find the corresponding digital signal pattern. What disadvantage do you find in this encoding technique ?

(c) What do you mean by pulse amplitude modulation (PAM) and pulse code modulation (PCM) ?

$$3+(4+2)+(3+3)$$

4. (a) What is synchronous transmission ? How asynchronous transmission differs with it ?

(b) Given a bandwidth of 11,000Hz (1,000 to 12,000Hz), draw the full duplex ASK diagram of the system. Find the carriers and the bandwidths in each direction assuming there is a gap of 1,000Hz between the bands in the two directions.

(c) What is the relationship between the number of slots in a frame and the number of input lines on TDM ? Define interleaving and bit padding in this multiplexing technique.

$$(3+2)+5+(1+2+2)$$

5. (a) A network uses cyclic redundancy checking technique for error detection. A sender in that network has to send the following data : 100110. Determine the bit pattern to be sent by the sender if the network uses the following polynomial ;  $x^3 + x^2 + 1$ .

(b) "In Go-Back-N ARQ, the size of the sender window must be less than  $2^n$ ." - Explain.

(c) What is piggybacking ?

(d) What is normal response mode and asynchronous balanced mode of transmissions in HDLC ?

5+4+2+(2+2)

6. (a) Describe the working principle of CSMA/CA.

(b) How the chip sequences are generated in CDMA ? Describe with an example.

(c) List the fields in the TCP header that are missing from UDP header. Give the reason for their absence.

6+5+4

7. Write short notes (any *three*) :

3×5.

(a) Classful addressing ,

(b) Fibre optic cable ,

(c) Switch ,

(d) DNS ,

(e) SMTP.

[ Internal Assessment : 30 Marks ]