17535

11819

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

Marks

1. (A) Attempt any THREE : **12**

(a) Define bit rate and baud rate. Write relationship between them.

(b) State aliasing effect. Draw neat diagram showing aliasing effect and how it can be overcome.

(c) What is multiplexing and state its need.

(d) Define PN sequence. Comment on maximum length sequence.

(B) Attempt any ONE : **6**

(a) Draw the block diagram of digital communication system and illustrate its working.

(b) Generate Hamming Code for binary data 110110 at the transmitter and decode the coded sequence at the receiver.

2. Attempt any TWO : **16**

(a) Describe the working of PCM transmitter and receiver. State advantages of PCM.

(b) Draw the block diagram of 16 QAM system. Explain its working. Draw its constellation diagram.

(c) Draw the block diagram and explain the working of OFDM multicarrier system.

3. Attempt any FOUR : **16**

(a) What is slope overload distortion. Explain how it can be avoided using ADM with neat waveform.

(b) Compare PCM with DM w.r.t.

(i) No. of bits required to encode one sample

(ii) Bandwidth requirement

(iii) complexity of circuit

(c) Compare TDMA, FDMA and CDMA technique for following points :

(i) Definition

(ii) Bandwidth available

(iii) Synchronization

(iv) Application

(d) Outline working principle of DPSK to convert digital into analog signal.

(e) Compare BASK, BFSK, QPSK and 16-PSK w.r.t. bandwidth requirement.

4. (A) Attempt any THREE : **12**

(a) What is channel modelling ? Explain any one with neat sketch.

(b) With the help of neat sketch illustrate uniform quanization.

(c) Draw block diagram of DSSS based CDMA system.

(d) Encode binary sequence 1100101 using line encoding techniques :

(i) NRZ – I

(ii) Manchester

(iii) Differential

(iv) AMI

(B) Attempt any ONE : **6**

(a) A discrete memoryless source has the letters A, B, C, D, E, F and G with corresponding probabilities {0.08, 0.2, 0.12, 0.15, 0.03, 0.02 and 0.4}. Derive Huffman Code for above source and determine the average length of the code words.

(b) Draw the block diagram of FHSS system and illustrate its working.

5. Attempt any TWO : **16**

(a) Illustrate the North American digital multiplexing hierarchy with neat diagram.

(b) With the help of block diagram explain QPSK system.

(c) State the types SS of modulation and list its application.

P.T.O.

6. Attempt any FOUR : **16**

(a) State two advantages and two disadvantages of DPCM system.

(b) How different signals can be multiplexed using FDM ? Explain with block diagram.

(c) What is M-ary encoding ? State any two advantages and one disadvantage.

(d) Generate cyclic redundant bits for binary sequence 1011010100 using divisor 1101.

(e) Draw the waveforms of BASK, BFSK, BPSK for binary sequence 110101.
