17535

15116

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.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. (A) Attempt any THREE of the following : **12**

(a) Define line coding. Give the classification of line coding.

(b) State and describe the sampling theorem with neat waveform.

(c) Define multiplexing. Describe the need of multiplexing.

(d) List the applications of spread spectrum modulation. (any four)

(B) Attempt any ONE of the following : **6**

(a) Draw the block diagram of the basic digital communication system. State the function of each block in detail.

(b) Describe working of CRC generator and checker with an example.

2. Attempt any TWO of the following : **16**

(a) Draw the block schematic of PCM transmitter. State the function of each block.

(b) Describe the generation of BFSK with block diagram. State the mathematical equation. Draw power density spectrum.

(c) Describe FDM technique with block diagram. Compare it with TDM with respect to definition, synchronization, cross talk and fading.

P.T.O.

3. Attempt any FOUR of the following : 16

(a) What is slope overload ? Draw the schematic of adaptive delta modulation technique.

(b) Draw block schematic of DPCM transmitter and receiver.

(c) Give the advantages of TDMA over FDMA (any four).

(d) What is M-ary encoding ? Compare the bandwidth requirement for BPSK, QPSK, QAM and M-ary PSK.

(e) What are the different types of QAM ? Draw constellation diagram of 4 QAM.

4. (A) Attempt any THREE of the following : 12

(a) Compare between analog and digital communication with respect to nature of signal, noise immunity, coding, bandwidth.

(b) Describe the process of quantization with neat sketch.

(c) Define PN sequence. Draw the pseudo random sequence generator.

(d) For the binary data stream 11000010 draw the Return to zero, non-Return to zero, AMI and Manchester Codes.

(B) Attempt any ONE of the following : 6

(a) State the different types of errors in digital communication. Describe each with example.

(b) Compare FHSS and DSSS system. (any four points)

5. Attempt any TWO of the following : 16

(a) Describe the basic principle involved in CDMA technology with neat sketch. State its any four advantages.

(b) Draw and describe QAM transmitter and receiver.

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

6. Attempt any FOUR of the following : 16

(a) State the advantages and disadvantages of PCM (any two each).

(b) State the principle of orthogonality and describe OFDM techniques.

(c) Compare between BPSK and QPSK w.r. to variable characteristics of the carrier, type of modulation, Bit rate/Baud rate and application.

(d) Define the following terms :

(i) Code word

(ii) Code rate

(iii) Hamming weight

(iv) Hamming distance related to code.

(e) Describe QPSK generator with waveforms.

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