22428

21819

3 Hours / 70 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. Attempt any FIVE of the following : **5 × 2 = 10**

(a) State any two advantages and disadvantages of digital communication system.

(b) State characteristics of communication channel.

(c) State sampling theorem.

(d) List different digital modulation techniques.

(e) State advantages of TDMA over FDMA.

(f) State the need of multiplexing.

(g) State applications of spread spectrum modulation.

2. Attempt any THREE of the following : **3 × 4 = 12**

(a) State Hartley's law and Shannon Hartley's theorem.

(b) Describe slope overload and granular noise in DM system.

(c) Describe natural sampling with neat sketch.

(d) Describe generation of BASK signal with the help of block diagram.

3. Attempt any THREE of the following : **3 × 4 = 12**

(a) Explain any one method of error detection with example.

(b) Draw the block diagram of PCM receiver with the help of relevant waveform and explain its working.

(c) Draw the block diagram of TDMA system and explain its working.

(d) Compare TDMA and CDMA on the basis of sharing of time and BW, synchronisation, code word, guard band and guard time.

4. Attempt any THREE of the following : **3 × 4 = 12**

(a) Explain digital communication system with the help of block diagram.

(b) Describe the working of an ADM transmitter with neat block diagram.

(c) Explain TDM technique with relevant diagram.

(d) Explain with the help of block diagram, spread spectrum modulation system.

(e) Encode binary sequence 10110110 using unipolar – RZ, polar – NRZ, AMI and Differential Manchester line coding techniques.

5. Attempt any TWO of the following : **2 × 6 = 12**

(a) Generate CRC code for data word 1101101001 by using divisor as 1101. State two advantages of CRC method.

(b) State BW required for BASK, BFSK and BPSK. Also draw waveforms for binary data 10110010 in ASK, FSK, PSK modulation.

(c) Justify that in DPCM system, less number of bits are transmitted than PCM system with the help of block diagram and relevant waveform.

6. Attempt any TWO of the following : **2 × 6 = 12**

(a) Draw the neat block diagram of QAM system, explain its working.

(b) Describe the M-ary PSK encoding technique with neat block diagram and also draw constellation diagram of BPSK, QPSK.

(c) Differentiate between direct sequence spread spectrum and frequency hopped spread spectrum.

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