

22481

23124

3 Hours / 70 Marks

Seat No.

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- 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 :** **10**
- State the advantages and disadvantages of Digital Communication System.
 - List different Digital Modulation Techniques.
 - Define Pseudo Noise (PN) sequence.
 - State characteristics of Data Communication.
 - List the different types of errors in Data Communication.
 - List the various multiple access techniques.
 - State Shannon Hartly Theorem.

P.T.O.

- 2. Attempt any FOUR of the following :** **12**
- a) Explain circuit switching network with neat sketch.
 - b) Compare TDMA and CDMA on basis of -
 - i) Sharing of time and B.W.
 - ii) Synchronization
 - iii) Guard band and Guard Time.
 - c) Draw block diagram of Digital Communication system. Explain each block.
 - d) Explain Go Back NARQ flow and error control techniques.
 - e) Explain virtual circuit concept in Data Communication.
- 3. Attempt any FOUR of the following :** **12**
- a) Encode binary sequence 11001010 using VRZ, NRZ-L, AMI and differential Manchester line coding techniques.
 - b) Explain checksum method of error detection with example.
 - c) Draw and explain block diagram of Data Communication System.
 - d) Explain CDM technique with its block diagram.
 - e) Compare TDM, FDM and CDM (Four points)
- 4. Attempt any THREE of the following :** **12**
- a) Describe the principle of packet switching technique with neat diagram.
 - b) Explain the concept of coherent and non coherent detection.
 - c) Explain types of Data framing.
 - d) Draw the neat block diagram of QAM system. Explain its working.
 - e) Explain Hamming code for one bit error detection with the example of data 1101.

5. Attempt any THREE of the following :**12**

- 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, 0.4 }
 - i) Derive Huffman code for above source and determine average length of the code word.
 - ii) Determine the coding efficiency of the Huffman code designed.
- b) Compare ASK, FSK and PSK modulation techniques. (any four points)
- c) Differentiate between DSSS and FHSS.
- d) Explain the following communication channel characteristics
 - i) Bit Rate
 - ii) Band Rate
 - iii) Band width
 - iv) Repeater distance.
- e) Explain PSK working with waveforms.

6. Attempt and TWO of the following :**12**

- a) Explain QPSK transmitter with block diagram and constellation diagram.
 - b) Generate CRC code for data word 1101101001 using divisor 1101. State two advantages of CRC method.
 - c) Define FDM. Explain frequency division multiplexing with block diagram.
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