

17535

11718

3 Hours / 100 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.

	Marks
1. (A) Attempt any THREE of the following :	12
(a) Define entropy and state its unit.	
(b) State sampling theorem & explain aliasing effect with neat diagram.	
(c) Define multiplexing & describe it's need in communication.	
(d) List the advantages of SS modulation over the fixed frequency modulation.	
(B) Attempt any ONE of the following :	6
(a) Draw the block diagram of digital communication system & explain it in detail.	
(b) Draw unipolar RZ, Polar NRZ, Polar Rz, Manchester, differential Manchester and AMT waveforms of line codes for data stream : 1101001.	

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

16

- (a) Draw the block schematic of PCM transmitter. Explain the same with waveform.
- (b) List the different types of digital modulation techniques and explain FSK modulation in detail.
- (c) Describe the basic principle involved in CDMA technology with neat sketch. State its any four advantages.

**3. Attempt any FOUR of the following :**

16

- (a) State limitations of DM. Explain how they overcome in ADM.
- (b) Compare digital pulse modulation with analog pulse modulation. (4 points)
- (c) Give the advantages of TDMA over FDMA. (any four)
- (d) Draw the block diagram of DPSK transmitter and state the function of each block.
- (e) Write the bandwidth requirement for ASK, FSK, BPSK and QPSK.

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

12

- (a) State the advantages and disadvantages of digital communication system.
- (b) Describe the process of quantization with neat diagram.
- (c) Define “PN sequence”. Draw the pseudo random sequence generator.
- (d) Calculate CRC code for data word 100100 to be transmitted and divisor is 1101.

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

6

- (a) A discrete memory less source has the letters A, B, C & D with corresponding probabilities {0.08, 0.2, 0.12, 0.4}
- (i) Derive Huffman code for the above source.
  - (ii) Determine the average length of the code word.
  - (iii) Determine the coding efficiency of the Huffman code design.
- (b) Compare FHSS and DSSS system (any six points).

**5. Attempt any TWO of the following :**

16

- (a) Describe the North American digital multiplexing hierarchy with neat diagram.
- (b) Draw the block diagram of QAM generation system & explain it with waveform.
- (c) Describe the direct sequence spread spectrum technique with the help of block diagram.

**6. Attempt any FOUR of the following :**

16

- (a) Draw block schematic of DPCM transmitter and receiver.
- (b) Compare TDM, FDM & CDM (3 points).
- (c) Compare ASK with FSK modulation. (any four points).
- (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 waveform.
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