16117

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

Marks

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

(a) Compare between analog and digital pulse modulation technique.

(b) State Shanon's Hartley theorem and write it's statement.

(c) State the need of mutliplexing and write it's type.

(d) Why pseudo-noise sequence used in spread spectrum modulation.

(B) Attempt any ONE : **06**

(a) Draw and explain basic communication system block diagram.

(b) Encode the following Binary data stream into unipolar RZ, unipolar NRZ, Polar Return Zero (RZ), Polar NRZ, AMI and split phase Manchester code Data stream : 10110100101

2. Attempt any TWO : **16**

(a) Explain principle of QAM with the block diagram. Also draw constellation diagram of 4-QAM.

(b) Write different types of Pulse Modulation. With the help of Block diagram and waveform explain PCM transmitter.

(c) Draw and Explain the block diagram of Code Division Multiplexing (CDM) system.

3. Attempt any FOUR : **16**

(a) Write about advantages and disadvantages of Delta Modulation.

(b) Draw and Explain QPSK Modulator.

(c) State sampling theorem and write about it's importance.

(d) With the help of OFDM block diagram. Explain it's working.

(e) Compare between ASK and FSK modulation. (any four points)

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

(a) Explain channel modelling in communication system.

(b) With the help of neat sketch explain quantization process.

(c) With example explain how Hamming code is used for single bit error correction implications.

(d) Explain fast frequency hopping with suitable diagram.

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

(a) State the different types of error present in digital communication system. Find the Hamming weight of following code vector.

X = 11010100

(b) Explain the working of direct sequence spread spectrum, with the help of suitable block diagram.

5. Attempt any TWO : **16**

(a) Draw and explain DPSK transmitter working principle.

(b) Draw block diagram of TDMA technology and explain it's operation. Give the advantage of TDMA over FDMA.

(c) Write about the importance of spread spectrum modulation. List out application of spread spectrum modulation.

6. Attempt any FOUR : **16**

(a) Draw and explain Adaptive Delta modulation. Transmitter block diagram.

(b) Generate the Cyclic Redundancy check (CRC) for the data word 110010101 using divisor 10101.

(c) Write about M-ary encoding. State any two advantage and disadvantage.

(d) Draw and explain PSK transmitter block diagram.

(e) Explain specifications of T-carrier system.
