17535

21819

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

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

(6) 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**

(i) Define channel capacity with mathematical expression.

(ii) State sampling theorem and list its types.

(iii) Describe the need of multiplexing.

(iv) List four applications of spread spectrum modulation.

b) **Attempt any ONE of the following:** **6**

(i) Draw the block diagram of basic digital communication system and explain its working.

(ii) Explain Hamming distance (dmin.). How many errors can be corrected and detected for the given minimum distance?

Marks

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

a) Draw the block diagram of PCM transmitter and Receiver system and explain function of each block.

b) Illustrate BFSK signal generation with block diagram and waveform. State bandwidth requirement and draw its frequency spectrum.

c) Explain working of CDMA. State its advantages and disadvantages.

3. Attempt any FOUR of the following: **16**

a) Explain companding with neat diagram.

b) Draw the block schematic of DM transmitter and Receiver.

c) Describe synchronous TDM with block diagram transmitter.

d) Compare QPSK and QASK (any four points)

e) Describe QAM transmitter with block diagram.

4. a) Attempt any THREE of the following: **12**

(i) State advantages and disadvantages of digital communication system.

(ii) Explain the need of using adaptive delta modulation.

(iii) Draw and explain spread spectrum modulation system.

(iv) For the binary data system 10110010 draw Unipolar RZ, Polar RZ, split phase Manchester and AMI.

b) Attempt any ONE of the following: **6**

(i) Explain working of CRC generator and checker.

(ii) Explain frequency hopping. Compare slow and fast frequency hopping (four points).

Marks

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

a) Draw block diagram of FDM transmitter and Receiver and explain function of each block.

b) Draw and explain block diagram of DPSK transmitter and receiver.

c) Describe DSSS transmitter and receiver working with block diagram.

6. Attempt any FOUR of the following: **16**

a) Compare analog and digital pulse modulation.

b) Compare FDMA and TDMA (four points)

c) Draw and explain the block diagram of ASK with suitable diagram.

d) Using Shannon's theorem, compute the maximum bit rate for a channel having bandwidth 3100 Hz and signal to noise ratio 20 dB.

e) Explain BPSK signal generation with block diagram and waveform.