M.E. First Semester (Electronics & Tele.) (Full Time) (C.G.S.- New)

13333 : Digital Communication Techniques : 1 ENTC 3

P. Pages : 2 | **AW - 3899**

Time : Three Hours | Max. Marks : 80

* 0 4 1 6 *

Notes : 1. Due credit will be given to neatness and adequate dimensions.
2. Assume suitable data wherever necessary.
3. Illustrate your answer necessary with the help of neat sketches.
4. All questions carry marks as indicated.
5. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION – A

1. a) For the matched filter receiver, prove that O/P SNR is given by **7**

$$SNR_o = \frac{2\epsilon}{N_o}.$$

b) Discuss the power spectra of CPFSK and CPM in detail. **7**

OR

2. a) Explain in brief signal space and vector space concept. **6**

b) Derive the expression for probability of error for m – ary PSK. **8**

3. a) Explain rate distortion function, scalar and vector quantization. **7**

b) Explain in detail Lempel – Ziv algorithm with suitable example. **6**

OR

4. a) Show that the entropy of an n – dimensional Gaussian vector $X = (x_1, x_2, ...x_n)$ with zero mean and covariance matrix C is **6**

$$H(X) = \frac{1}{2}\log(2\pi e)^n |c|$$

b) Explain block schematic of delta modulation scheme. **7**

5. a) Explain in detail trellis coded modulation. **6**

b) A convolutional code is described by **7**
$g_1 = [101], g_2 = [111], g_3 = [111]$
i) Draw the encoder corresponding to this code.
ii) Draw the state – transition diagram for this code.
iii) Draw the trellis-diagram for this code.
iv) Find the T.F. and free of the code.
v) Verify whether or not this code is catastrophic.

OR

6.	a)	Explain in detail BCH Code.	**6**
	b)	Explain the temporal wave form coding for PCM and DPCM with block diagram.	**7**

SECTION – B

7.	a)	Explain the data detection for controlled ISI.	**7**
	b)	Discuss the probability of error detection for PAM with zero ISI.	**7**

OR

8.	a)	Explain the Nyquist pulse shaping criteria for zero and controlled ISI.	**8**
	b)	Explain the effect of ISI on eye – opening.	**6**
9.	a)	Explain in detail adaptive linear equalizer.	**6**
	b)	Explain in detail the DFE and its performance characteristics.	**7**

OR

10.	a)	Explain in detail the LMS algorithm.	**7**
	b)	Explain in detail peak distortion criterion.	**6**
11.	a)	Explain the effect of pulsed – Interference on DS spread spectrum system.	**6**
	b)	Explain synchronization of spread spectrum system.	**7**

OR

12.	a)	Explain in detail the different applications of DS spread spectrum system.	**7**
	b)	Explain time hopping spread spectrum system.	**6**

****