



- iii) ADM involves additional hardware designed to provide variable step size
- a) reducing slope overload effect
 - b) reducing granular noise
 - c) reducing quantization noise
 - d) none of these.
- iv) Measure of information $I (m_k)$ of a message m_k with probability P_k is given by
- a) $\log_b (1/P_k)$
 - b) $\log_b (P_k)$
 - c) $\log_b (1/P_k)$
 - d) $\log_b (1/1-P_k)$.
- v) In T1 carrier system one frame duration equals
- a) 128 μ s
 - b) 125 μ s
 - c) 500 μ s
 - d) 800 μ s.
- vi) Higher degree of uncertainty means
- a) lesser information
 - b) more information
 - c) zero information
 - d) none of these.



- vii) In a PCM system, the quantization noise depends upon
- a) no. of quantization levels only
 - b) the sampling rate
 - c) both the sampling rate and no. of quantization levels
 - d) none of these.
- viii) In a Delta modulation system, the granular noise occurs when the modulating signal
- a) increases rapidly
 - b) remain constant
 - c) decreases rapidly
 - d) none of these.
- ix) PCM generation requires a LPF at the beginning because
- a) to eliminate aliasing effect
 - b) to eliminate quantization noise
 - c) to eliminate decoding noise
 - d) none of these.

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- x) In vestigial spectrum the range of roll of factor is
- a) $1 < r < 0$
 - b) $0 < r < 1$
 - c) $0 < r < \infty$.
- xi) The sensitivity of a system to timing error is determined by
- a) width
 - b) opening
 - c) rate of eye closer of the eye diagram.
- xii) In QPSK the transmission bandwidth required is
- a) f_b
 - b) $2f_b$
 - c) $f_b / 2$
 - d) $4f_b$ $f_b \rightarrow$ Bit frequency.



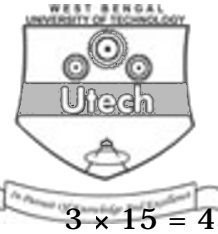
GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following.

3 × 5 = 15

2. A television signal having a BW of 4.2 MHz is transmitted using binary PCM system. Number of quantization level used is 512. Determine
 - a) Code word length
 - b) Transmission bandwidth
 - c) Output signal to quantization ratio. 1 + 2 + 2
3. Prove that the output of SNR of a matched filters is $8E_s/\eta$, where E_s is the signal energy and $G_n (f) = \eta/2$ of white Gaussian noise. Hence find the probability of error of it.
4. Draw ASK, FSK, PSK signal to transmit data stream 1111000111. What is complementary error function ?
 $3\frac{1}{2} + 1\frac{1}{2}$
5. What do you mean by Cross-talk ? How it can be overcome ? 2 + 3
6. a) Find the Nyquist rate and Nyquist interval for the following signal :
$$X (t) = 1/2\pi \cos (4000 \pi t) \cos (1000 \pi t).$$
 - b) What do you mean by pulse detection error ? Why we are using regenerative repeater ? 3 + 2
7. What do you mean by Aliasing effect ?



GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following.

$3 \times 15 = 45$

8. a) What is the difference between uniform and non-uniform quantizer ? What is the necessity of non-uniform quantizer ? Explain companding.
- b) For an 'n' bit PCM system prove that signal to noise ratio in dB is given by
- $$(S/N_9) \text{ dB} = 1.76 + 6.02 n$$
- for a full scale modulating signal with amplitude 'V' volts.
- c) What is the disadvantage of delta modulation ? What method is used to overcome the problem which arises in delta modulation ?
- d) Draw and explain the block diagram of transmitter and receiver of a delta modulator ?

$[(1 + 2) + 3 + (2 + 1) + 6]$

9. a) What do you mean by coherent and non-coherent reception ?
- b) Explain detection of QPSK with proper diagram.
- c) Mention advantages of QPSK modulation technique.
- d) Discuss the requirement of bit synchronization and frame synchronization in digital communication system.

$3 + 7 + 2 + 3$



10. a) Why pulse shaping is required in digital communication ?
b) What is the Nyquist criterion for zero ISI ?
c) Explain partial response signaling.
d) What is the information obtained from eye pattern ?

3 + 4 + 4 + 4

11. a) What is a optimum filter ?
b) Find the transfer function of optimum filter.
c) Define matched filter
d) Find the error probability of the matched filter.

2 + 5 + 2 + 6

12. Write short notes on any *three* of the following : 3 × 5

- a) CDMA
b) Equalizer
c) Integrate & Dump Filter
d) Linear Block Code
e) Differential Encoding.

