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Paper Code : EC601 DIGITAL COMMUNICATIONS

UPID : 006031

Time Allotted : 3 Hours

Full Marks : 70

The Figures in the margin indicate full marks.

Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer any ten of the following :

[1 x 10 = 10]

- (I) If each pulse of the sequence to be detected is in _____ shape, the pulse can be detected without ISI.
- (II) For generation of FSK the data pattern will be
a) RZ pattern b) NRZ pattern c) Split-phase d) Manchester e) None of the above
- (III) The data rate of QPSK is _____ of BPSK.
- (IV) In MSK, the difference between the higher and lower frequency is _____
- (V) The distribution function of random variable is
a) $P(X \text{ less than or equal to } x)$
b) $P(X \text{ greater than or equal to } x)$
c) $P(X \text{ less than } x)$
d) $P(X \text{ greater than } x)$
- (VI) Which can be used for periodic and non periodic?
- (VII) Equalization process includes Maximum likelihood sequence estimation & Equalization with filters. True /False
- (VIII) Quantization noise can be reduced by _____ the number of levels.
- (IX) The maximum synchronizing capability in coding techniques is present in
- (X) ASK modulated signal has the bandwidth
- (XI) The maximum likelihood sequence estimator adjusts _____ according to _____ environment.
- (XII) The factors that cause quantizing error in delta modulation are _____ and _____

Group-B (Short Answer Type Question)

Answer any three of the following :

[5 x 3 = 15]

2. Define random variables. [5]
3. What is matched filter? Deduce the transfer function of a matched filter. [5]
4. Explain a BFSK modulator system with necessary diagrams. [5]
5. How DM is improved over PCM? [5]
6. For the data bit 10110001, draw the waveforms for ASK, FSK, PSK, QPSK [5]

Group-C (Long Answer Type Question)

Answer any three of the following :

[15 x 3 = 45]

7. (a) Explain Random process. [8]
(b) What is the importance of Gaussian Distribution. [7]
8. Explain the concept of AWGN channel. Explain Geometric representation of signals. [15]
9. What is optimum filter? Explain operation of Integrate and Dump receiver. [15]
10. (a) Explain Delta modulation and demodulation in detail with suitable diagram. [10]
(b) Compare Delta modulation and Pulse code modulation scheme. [5]
11. (a) A Television signal having a bandwidth of 4.2 MHz is transmitted using binary PCM system. Given that the number of quantization levels is 512. Determine Code word length, Transmission bandwidth, Final bit rate, output signal to quantization noise ratio. [10]
(b) Compare PCM and DPCM. [5]

*** END OF PAPER ***