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Total Number of Pages : 02

B.Tech.
PET6I101

6th Semester Regular Examination 2017-18

DIGITAL COMMUNICATION

BRANCH : ECE, ETC

Time : 3 Hours

Max Marks : 100

Q.CODE : C155

Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.

Part – A (Answer all the questions)

- Q1** Answer the following questions: *multiple type or dash fill up type* : (2 x 10)
- a) ISI may be removed by using
 - i. Differential coding
 - ii. Manchester coding
 - iii. Polar NRZ
 - iv. None of the above
 - b) The characteristics of compressor in μ -law companding are
 - i. Continuous in nature
 - ii. Logarithmic in nature
 - iii. Linear in nature
 - iv. Discrete in nature
 - c) The _____ and _____ are the two noise effects in Delta modulation.
 - d) Scrambling of data is
 - i. Removing long strings of 1's and 0's
 - ii. Exchanging of data
 - iii. Transmission of digital data
 - iv. All of the above
 - e) Matched filters are used
 - i. For maximizing signal to noise ratio
 - ii. For signal detection
 - iii. In radar
 - iv. All of the above
 - f) Indicate which of the following pulse modulation system is analog.
 - i. PCM
 - ii. Differential PCM
 - iii. PWM
 - iv. Delta modulation
 - g) The probability error of DPSK is _____ than that of BPSK. The band width of BFSK is _____ than BPSK.
 - i. Higher, Higher
 - ii. Lower, Lower
 - iii. Lower, Higher
 - iv. Higher, Lower
 - h) MSK is similar to
 - i. Continuous phase FSK
 - ii. BPSK
 - iii. BFSK
 - iv. QPSK
 - i) Regenerative repeaters are used for
 - i. Eliminating noise
 - ii. Construction of signals
 - iii. Transmission over long distances
 - iv. All of the above

- j) The biggest disadvantages of PCM is
- i. Its inability to handle analog signal
 - ii. The high error rate which its quantizing noise introduces
 - iii. Its incompatibility with TDM
 - iv. The large bandwidths that is required for it.

Q2 Answer the following questions: Short answer type : (2 x 10)

- a) States important properties of line codes.
- b) What is the advantage of gray coding of the QPSK system? What is the advantage of differential encoding of the input to the QPSK system?
- c) What is meant by aliasing effect? Explain.
- d) What is the advantage of delta modulation over pulse modulation schemes?
- e) What is the difference between coherent and non-coherent binary modulation schemes?
- f) If the data transmission rate is R of a communication system, how much bandwidth is required if QPSK modulation is used?
- g) What is meant by "Adaptive" in adaptive delta modulation?
- h) What is pulse-shaping? Give one example of pulse-shaping filter function.
- i) What do you mean by source coding and channel coding?
- j) What do you mean by quantization?

Part – B (Answer any four questions)

- Q3** a) With the help of neat block diagram explain the principle of adaptive delta modulation. Compare delta modulation with adaptive delta modulation. (10)
 b) What is Nyquist criterion of zero ISI? Explain. (5)
- Q4** a) Determine the bandwidth required for M-ary FSK system. Draw the geometrical representation of M-ary FSK signals and find out distance between the signals. (10)
 b) What is eye pattern? How is eye pattern obtained on CRO? (5)
- Q5** a) Give a block schematic for generation and reception of M-ary PSK. (10)
 b) In a binary PCM system, the output signal-to-quantizing-noise ratio is to be held to a minimum value of 40 dB. Determine the number of required levels and find the corresponding output signal to quantizing noise ratio. (5)
- Q6** a) Explain working principle of the T1 digital system. How frame synchronization is achieved in this system? (10)
 b) What do you mean by an optimum filter? Derive its transfer function. (5)
- Q7** a) Write short notes on Multiplexer and Regenerative Repeater. (10)
 b) Why timing extraction is required in a digital communication system? Explain any scheme for this. (5)
- Q8** a) Draw the signal space representation of QPSK and BPSK signals. Show that for the same data rate and same bit energy they have the same BER probability on the same AWGN channel, although one of the signals occupy half the bandwidth. (10)
 b) What is matched filter? Find out its probability of error (5)
- Q9** a) What is ISI? Explain the causes of ISI. Enumerate methods to take care of it. Is it detrimental to a communication system's performance? (10)
 b) Given a sine wave of frequency f_m and amplitude A_m applied to a delta modulator having step size Δ . Show that the slope overload distortion will occur if $A_m > \frac{\Delta}{2\pi f_m T_s}$ (5)
 Where T_s is the sampling period.