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C028511(028)

B. Tech. (Fifth Semester) Examination, Nov.-Dec. 2021

AICTE

~~(New~~ Scheme)

(Electronics & Telecommunication Engineeing Branch)

DIGITAL COMMUNICATION

(BT-3028)

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt all questions. Part (a) of each question is compulsory. Attempt any ***two*** *parts from (b), (c) & (d).* Part(a) is of 04 marks, Parts b,c,d each of 08 marks

Unit-I

1. (a) A signal

$$m(t) = 2 \cos 6000 \, \pi t + 4 \cos 8000 \, \pi t + 6 \cos 10000 \, \pi t$$

is to be truthfully represented by its samples. What is the minimum sampling rate from (1) low pass sampling theorem consideration and (2) band pass consideration?

(b) State and prove sampling theorem.

(c) Differentiate among PAM, PWM and PPM.

(d) Explain with the help of block diagram TDM PAM system.

Unit-II

2. (a) Define the followinig terms :
   (i) SNR
   (ii) Companding

(b) Explain with the help of block diagram PCM transmission and reception.

(c) Derive the formula for signal to quantization noise ratio for delta modulation.

(d) Explain Adaptive Delta modulation with the help of block diagram Also discuss its advantages and disadvantages.

Unit-III

3. (a) Write a note on eye Diagram.

(b) Derive the expression for power spectral density for unpolar signaling.

(c) Explain srambling with the help of an example.

(d) Derive the expression for probability of error for bipolar signaling.

Unit-IV

4. (a) Differentiate among ASK, FSK & PSK on the basis of following points :
   (i) Definition
   (ii) Representation of data 101101

(b) Explain DPSK transmitter and receiver with the help of block diagram and waveform.

(c) Explain QPSK transmitter and reciever with the help of block diagram and waveform.

(d) Write a short note on M-ary PSK.

Unit-V

5. (a) Define Spread Spectrum. Name its and different types. Also list some of its applications.

   (b) Explain DSSS. Derive the formula for ranging using DSSS.

   (c) Explain the generation and characteristics of PN sequence with th help of block diagram.

   (d) Briefly explain Tracking and Acquisition of an FH signal using block diagram and waveforms.