VIT
Vellore Institute of Technology

Final Assessment Test – May 2

Course: BECE306L - Digital Communication Syst

Class NBR(s): 1166 / 1168

Time: Three Hours

- KEEPING MOBILE PHONE/ELECTRONIC DEVICES EVEN IN 'OFF' POSITION IS TREATED A
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

General Instruction: Error Function table to be permitted

Answer ALL Questions

(10 X 10 = 100 Marks)

1. a) State sampling theorem with appropriate figures and examples. What aliasing and explain how it will affect a digital communication system?

   b) Evaluate the Nyquist rate and Nyquist interval for the following signals

   (i) $m_1(t) = \frac{1}{2\pi}\cos(4000\pi t)\cos(1000\pi t)$

   (ii) $m_2(t) = sinc(700t) + sinc(500t)$

2. a) A Television signal having a bandwidth of 4.2 MHz is transmitted using P system. Given that the number of quantization levels is 512. Determine:

   (i) Code word length

   (ii) Transmission bandwidth

   (iii) Final bit rate

   (iv) Output signal to quantization noise ratio.

   b) For a sinusoidal modulating signal

   $$m(t) = A\cos\omega_m t$$

   $$\omega_m = 2\pi f_m$$

   Prove that the maximum output signal-to-quantizing-noise ratio in a d modulation system under the assumption of no slope overload is given by

   $$SNR_0 = \left(\frac{S}{N_Q}\right)_0 = \frac{3f_s^3}{8\pi f_m^2 f_M}$$

   Where $f_s = 1/T$, is the sampling rate and f_M is the cutoff frequency of a low- filter at the output end of the receiver.

3. What are the desirable properties of digital waveform? To transmit a bit sequ 10011011, draw the resulting waveforms using:

   (i) Unipolar RZ

   (ii) Unipolar NRZ

   (iii) Bipolar RZ

   (iv) AMI RZ

   (v) Manchester.

4. What is Inter Symbol Interference (ISI) and what is Nyquist criterion for