Roll No. .....

National Institute of Delhi

B.Tech (ECE), 5th Semester

Subject: Digital Communication **Time:** 2 Hrs
Sub Code: ECB-303 **Max. Marks:** 25

Note: Attempt all the questions.

Q.1

(a) Explain the concept of Intersymbol Interference along with its Causes and Remedies.

(b) Consider audio signal composed of sinusoids term $s(t) = 3 \cos 500 \pi t$

(i) Find signal to quantization noise ratio when is quantized using 10 bit PCM.

(ii) How many bits of quantization are needed to achieve signal to quantization noise ratio of at least 40 dB.

(c) Explain the need of Robust Quantization. How it is implemented?

(d) Differentiate between Bit rate & Baud rate, Coherent & Non-Coherent Systems.

(e) The bit sequence 1011100011 is to be transmitted. Draw the waveforms for following formats neatly.

(i) Unipolar RZ and NRZ

(ii) Split phase Manchester

(iii) Polar Quaternary NRZ (5*3=15)

Q.2 Derive an expression for Power Spectral Density of NRZ Unipolar Format. (5)

Q.3 Derive an expression for Signal to Quantization noise ratio of PCM system taking $m(t)=A \cos \omega_m t$. (5)

****Best Wishes****