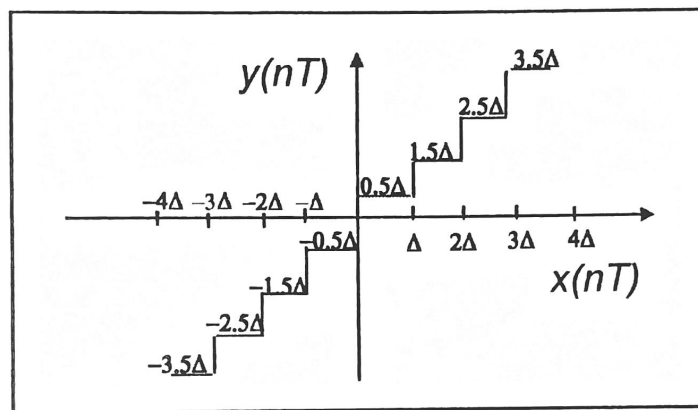


beginning

6. What is the advantage of slotted Aloha over Aloha? [2 marks]
7. A high quality speech signal has a bandwidth of 8 kHz.
- a. Suppose that the speech signal is to be quantized and then transmitted over a 32 kbps modem. What is the SNR of the received speech signal. (In dB, SNR = 6m - 7.2). [2 marks]
- b. What modem speed is needed if we require an SNR of 45 dB? [2 marks]
8. The figure below shows the input and output relationship of a quantization process.



- a. Sketch a graph showing the error of the quantization process, $x(nT) - y(nT)$, against the input signal. [3 marks]
- b. Show that the mean square error is $\frac{\Delta^2}{12}$. [3 marks]
9. A 10 KHz baseband channel is used by a digital transmission system. Ideal pulses are sent at the Nyquist rate, and the pulses can take 32 levels. What is the bit rate of the system? [2 marks]
10. The data fragment, DLE, STX, A, DLE, B, DLE, ETX, is to be processed by the character-stuffing algorithm. What is the output after stuffing and framing? [2 marks]

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