

**EE573: Digital Communications II**  
**Practice Problem #3**

**Baseband Pulse Transmission**

An analog signal is sampled, quantized, and encoded into a binary PCM wave. The number of quantization levels used is 128. A synchronizing pulse is added at the end of each code word representing a sample of the analog signal. The resulting PCM wave is transmitted over a channel of bandwidth 12 kHz using a 16-ary PAM system with raised-cosine spectrum. The rolloff factor is 0.5.

(a) Find the rate (bits/sec) at which information is transmitted through the channel.

(b) Find the rate at which the analog signal is sampled. What is the maximum possible value for the highest frequency component of the analog signal?

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