JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY-2007

B.TECH DEGREE EXAMINATION

COMMUNICATION SYSTEM

(ELECTRONICS & COMMUNICATION ENGINEERING)

JUNE-2007

TIME-3HOUR
MARK-80

ANSWER ALL THE QUESTIONS

1. An event has six possible outcomes with the probabilities 1/2,1/4,1/81/16,1/32,1/32 . Find the entropy of the system. Also find rate of information if there are 16 outcomes per second.

2 .A continuous signal is band limited to 5 KHz. The signal is quantized in 8 levels of a PCM system with the probabilities 0.25, 0.2, 0.2, 0.1, 0.1, 0.05, 0.05 and 0.05. Calculate the entropy and the rate of information.

3. A periodic signal has a bandwidth of 20 Hz. The highest frequency is 60 Hz. What is the lowest frequency? Draw the spectrum if the signal contains all frequencies of the same amplitude?

4. A digital signal has four levels. How many bits are needed per level?

5. We have a low-pass channel with bandwidth 100 kHz. What is the maximum bit rate of this channel?

6 .Consider a noiseless channel with a bandwidth of 4000 Hz transmitting a signal with four signal levels. Calculate maximum bit rate.

7.We need to send 265 kbps over a noiseless channel with a bandwidth of 20 kHz. How many signal levels do we need?

8.The power of a signal is 10 mW and the power of the noise is 1microW; what are the values of SNR and SNRdB ?

9.Calculate the values of SNR and SNRdB for a noiseless channel ?

10.The signal-to-noise ratio is often given in decibels. Assume that SNRdB = 36 and the channel bandwidth is 2 MHz. Calculate theoretical channel capacity?