Worksheet:
Introduction to Digital Communications

1. For the following signals, calculate the bandwidth, centre frequency and state if they are practically baseband, bandpass or baseband.

	Telephone speech	**Hi-fi Audio**	**FM Radio Station**
Lowest Frequency	300Hz	20Hz	98.11MHz
Highest Frequency	3.4kHz	20kHz	98.29MHz

2. What are the benefits of storing and communicating a signal in a digital form instead of just using an analogue signal?

3. An analogue signal has a dynamic range of 20dB. How many quantization levels are required to represent this signal in digital form?

4. For the equation below, what 3 variables are commonly used to carry information?

$$y(x) = a\sin(2\pi bx + c).$$

5. How many whole number of bits are needed to represent a signal with 255 quantization intervals?

6. A signal is sampled at 1000Hz. It is quantized into 255 intervals. The data is to be communicated serially. What is the clock rate for the parallel to serial shift register?