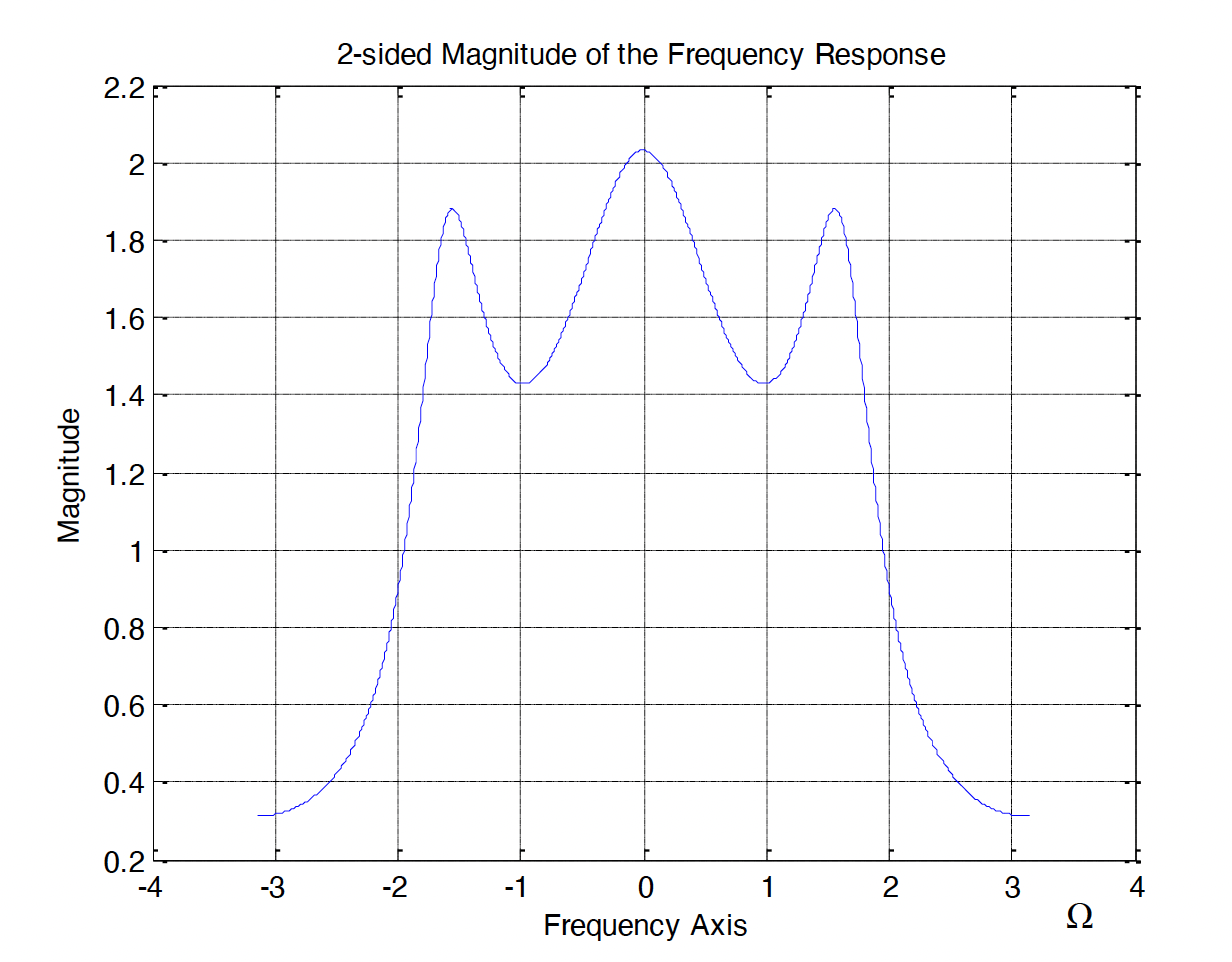
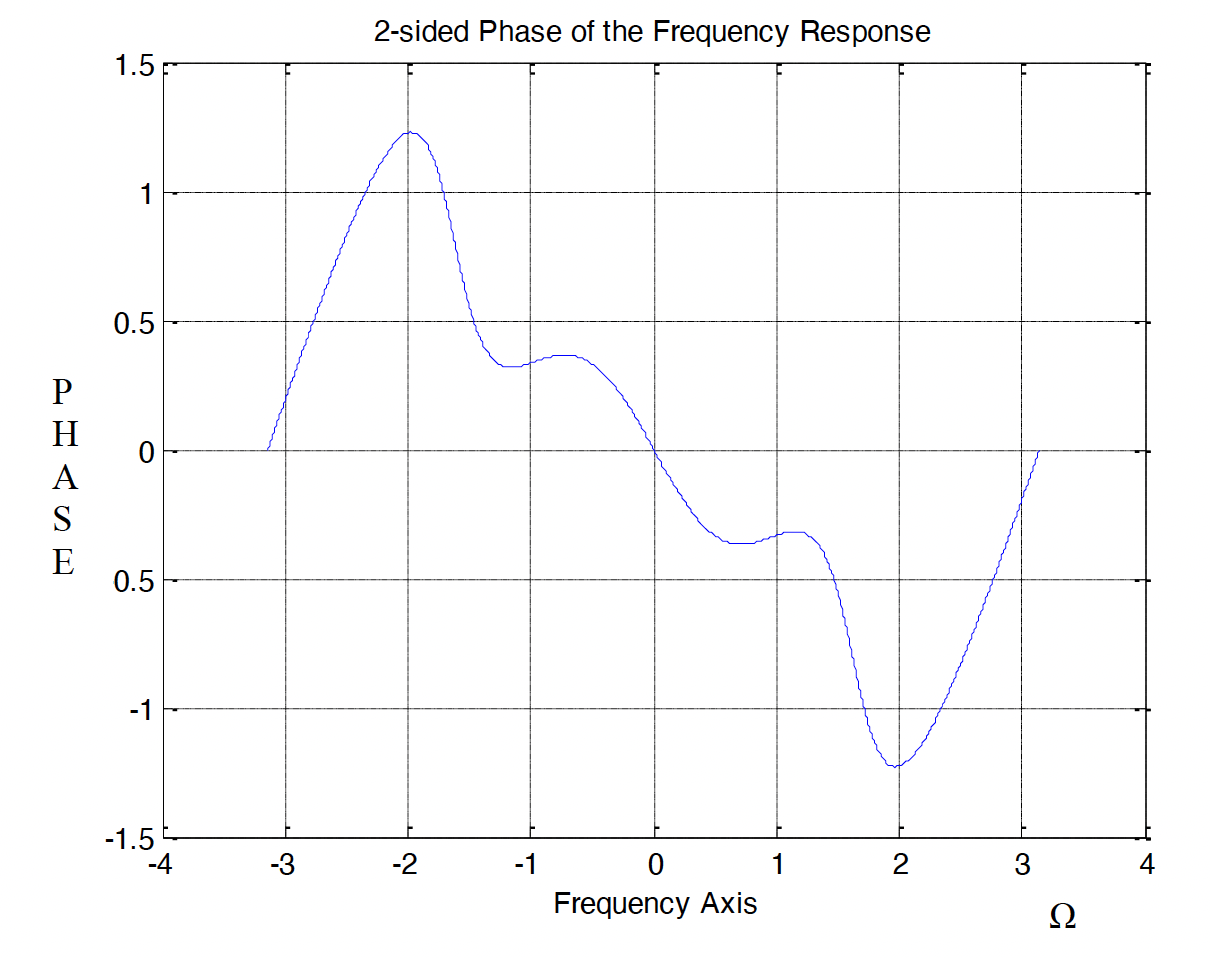
**Tutorial week 11**

A manufacturer produces a digital filter operating at 10kHz sampling frequency. The filter has a frequency response as indicated in Fig Q1. This shows the 2-sided magnitude and 2-sided phase plots of the frequency response of the digital filter. The following continuous signal is sampled using a sampling frequency *fs= 10kHz* to produce a sampled signal

Using the frequency response curves given in Fig 1 determine the steady state output of this DSP device due to the input signal

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**(b)**

A speech signal is sampled with a sampling frequency of 16kHz, a music signal is sampled at 44.1kHz and an audio signal is sampled at 48kHz. These signals are to be mixed (added together) and the resulting signal is to be filtered by a filter that has a sampling frequency of 64kHz. Design a suitable multirate DSP system that will produce the desired output. In your design clearly indicate the specifications of each sub unit.