EE Qualifying Exam
January 2012

1. Define

$$\text{Ш}_p(t) = \sum_{k=-\infty}^{\infty} \delta(t - pk), \quad p > 0.$$

What is $\mathcal{F}\text{Ш}_p$, the Fourier transform of $\text{Ш}_p$? Deduce from your answer that $\text{Ш}_p$ is even.

2. Suppose we input $\text{Ш}_p$ into a linear time-invariant system $L$ and measure the output, $w = L\text{Ш}_p$. Is it possible to recover the impulse response $h$ of the system from this information?