

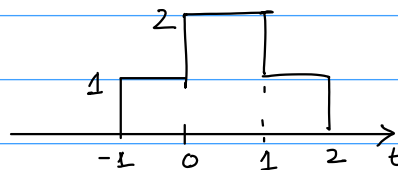
AV314 - Assignment 2.Signals and Systems Review - Part 1.

- 1) Let
- $u(t)$
- be the unit step signal, i.e.,

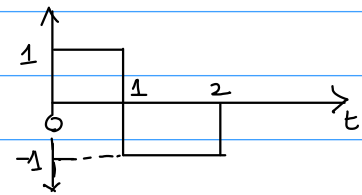
$$u(t) = \begin{cases} 1, & t \geq 0 \\ 0, & t < 0 \end{cases}$$

express the following signals using linear, time shifted combinations of the unit step signal.

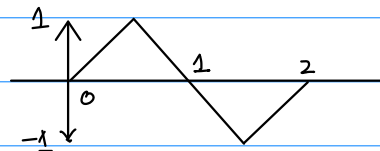
a)



b)



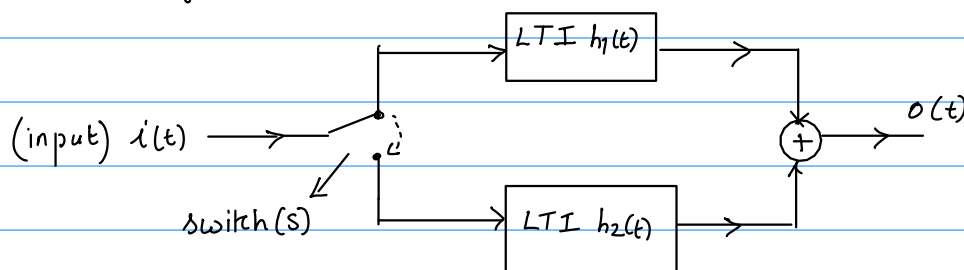
- 2) Suppose
- $p(t)$
- is the signal



define $\tilde{p}(t) = \sum_{k=-\infty}^{\infty} p(t - 2k)$.

- Is the signal $\tilde{p}(t)$ periodic? Justify
- Find out the energy of $p(t)$ and $\tilde{p}(t)$.
- Find out the power of $p(t)$ and $\tilde{p}(t)$.

- 3) Consider a system which is represented using the following block diagram



The input $i(t)$ is transformed into the output $o(t)$ using the above system.

The switch (S) connects $i(t)$ to the upper path for $t < 100$. At $t = 100$, the switch instantaneously connects $i(t)$ to the lower path. The two blocks in the upper and lower paths are LTI systems with impulse responses being $h_1(t)$ and $h_2(t)$ respectively.

Express the output $o(t)$ in terms of $i(t)$ and the impulse responses.

Questions from the textbook - Comm. Systems - Upamanyu Madhow.

- Problems 2.1 and 2.2.
- Examples 2.3.1 and 2.3.2