1. Consider the cascade interconnection of three causal LTI systems, $x[n] \rightarrow h_1[n] \rightarrow h_2[n] \rightarrow h_2[n] \rightarrow y[n]$. If $h_2[n] = u[n] - u[n-2]$ and the overall impulse response is $h[n] = \delta[n] + 5\delta[n-1] + 10\delta[n-2] + 11\delta[n-3] + 8\delta[n-4] + 4\delta[n-5] + \delta[n-6]$.

(a) Find the impulse response $h_1[n]$

(b) Find the response of the overall system to the input $x[n] = \delta[n] - \delta[n-1]$

2. Calculate convolution.

$$x(t) = \begin{cases} 
1 & 0 < t < T \\
0 & \text{otherwise}
\end{cases} \quad \text{and} \quad h(t) = \begin{cases} 
t & 0 < t < 2T \\
0 & \text{otherwise}
\end{cases}$$