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## ECE250: Signals and Systems

### Quiz 3 (20/09/2022)

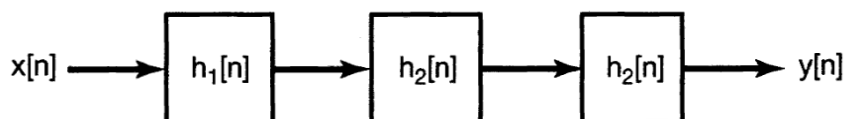
Max. Marks: 10

1. (CO2) Consider the cascade interconnection of three causal LTI systems as given in Fig. 1(a). Please note that  $y[n] = x[n] \otimes h_1[n] \otimes h_2[n] \otimes h_2[n]$ , where  $\otimes$  denotes the convolution operator.

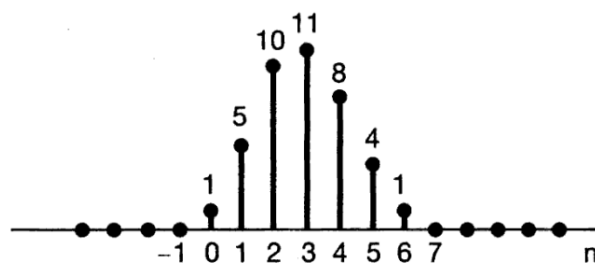
The impulse response  $h_2[n]$  is:

$$h_2[n] = u[n] - u[n - 2],$$

and the overall impulse response is shown in Fig. 1(b).



(a)



(b)

**Figure 1:** Ques-1

- (a) Find the impulse response  $h_1[n]$ . (7 marks)
- (b) Find the output  $y[n]$  of the system for the input  $x[n] = \delta[n] - \delta[n - 1]$ . (3 marks)