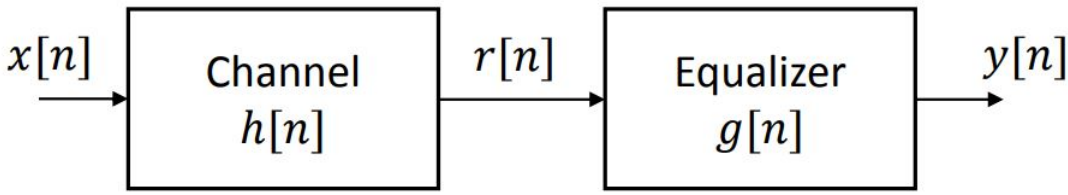
Started on	Wednesday, 16 February 2022, 8:45 AM
State	Finished
Completed on	Wednesday, 16 February 2022, 8:58 AM
Time taken	13 mins 16 secs
Grade	Not yet graded

Question 1

Complete

Marked out of 7.00

In a communication system, the receiver uses an equalizer to compensate for the distortion that a transmitted signal experiences while propagating through the communication channel or medium. Consider the discrete time model of a communication system shown below:



where $h[n]$ and $g[n]$ are the impulse responses of the LTI communication channel and the causal LTI equalizer, $x[n]$ is the transmitted signal, $r[n]$ is the received signal at the receiver, and $y[n]$ is the output of the equalizer. The equalizer is to be designed so that $y[n] = x[n]$.

a) If $h[n] = \left(\frac{1}{2}\right)^n u[n]$ and $g[n] = g_0\delta[n] + g_1\delta[n-1]$, then what should be the values of g_0 and g_1? (4 marks)

b) If $h[n] = h_0\delta[n] + h_1\delta[n-1]$, determine $g[n]$ in terms of h_0 and h_1. (3 marks)

(Please upload scanned pdf for your answer or sent it by email to abhishek.dixit@iitd.ac.in. Write clearly and neatly. Explain all the steps. You will get a zero if I cannot understand what you have written).

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