School of Engineering
Department of Electrical and Computer Engineering

332:421 **Wireless Communications Systems** **Fall 2010**

Quizlette 2

Write all answers on the printed sheet

1. A given discrete time channel used in a communication system has unit sample response

$$h_k = \begin{cases} \frac{1}{2^k} & k = 0, 1, ... \\ 0 & \text{otherwise} \end{cases}$$

(a) Carefully sketch the unit sample response h_k.

(b) Determine the filter response to input $x_n = \delta_n - \frac{1}{2}\delta_{n-1}$ where δ_n is the unit sample function.

(c) Please provide a static FIR equalizer filter for use at the receiver with this channel.

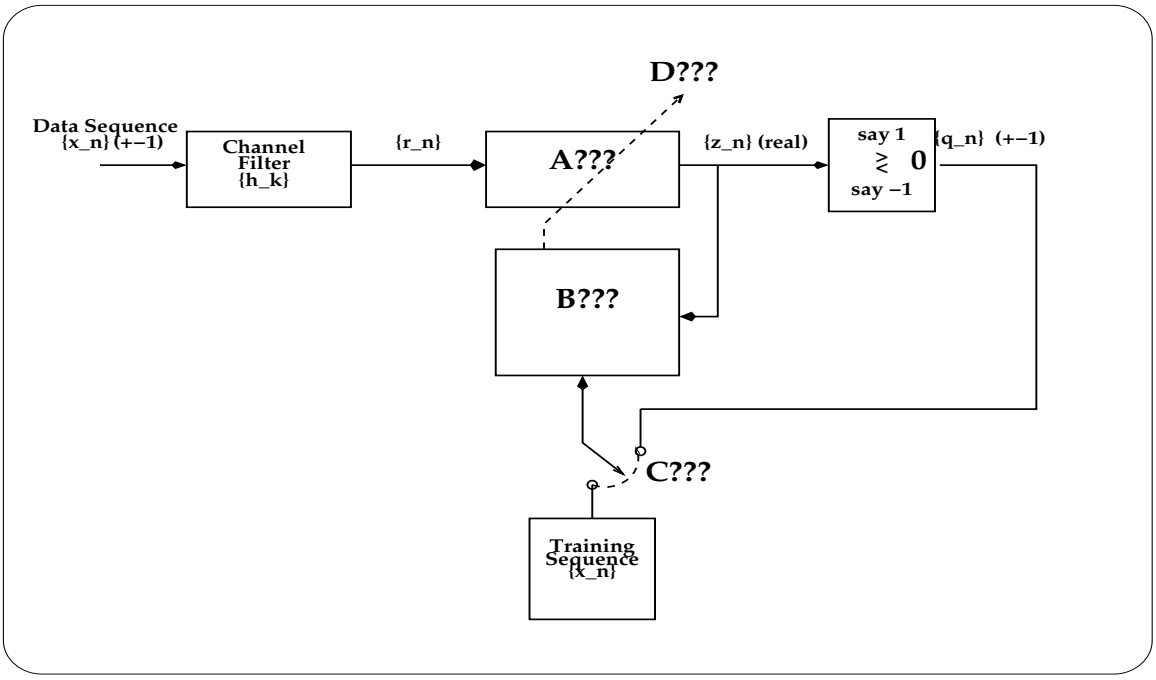

Figure 1: Adaptive equalizer block diagram

2. Figure 1 shows an adaptive equalizer for a communications channel. Please describe (including mathematics) the function and operation of components **A**, **B**, **C** and **D**.