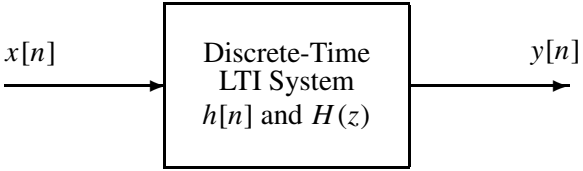
**PROBLEM:**




An LTI discrete-time system is depicted above. The system function of the system is

$$H(z) = \frac{1}{(1 - \frac{1}{2}z^{-1})(1 + \frac{1}{2}z^{-1})}.$$

(a) It is desired that the *output* of the system be $y[n] = (-\frac{1}{2})^n u[n]$. Find the $z$-transform $Y(z)$ of this output signal.

(b) Use the $z$-transform method to determine the $z$-transform $X(z)$ of the input to the system such that the output of the system will be $y[n] = (-\frac{1}{2})^n u[n]$.

(c) Use the partial fraction expansion method to determine the impulse response $h[n]$ of the system with system function $H(z)$ given above.