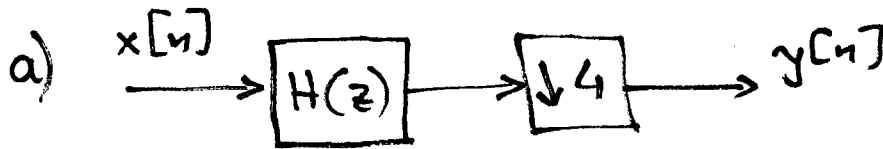


Quiz 7
March 7, 2005

For each of the following systems show a more efficient realization in terms of polyphase decompositions. Let:

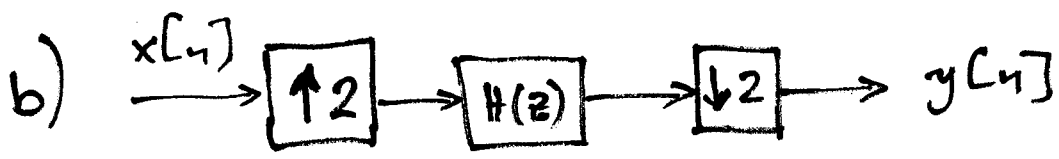
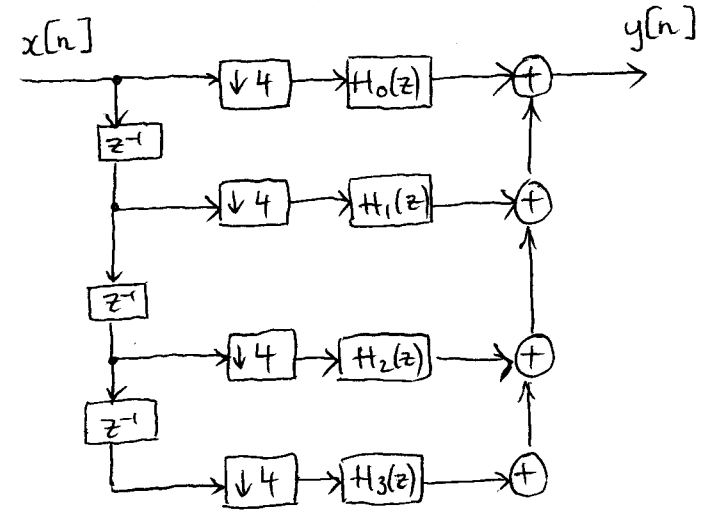
$$H(z) = 1 + z^{-1} + 2z^{-2} - z^{-3} + z^{-4} - z^{-5} + z^{-6}$$



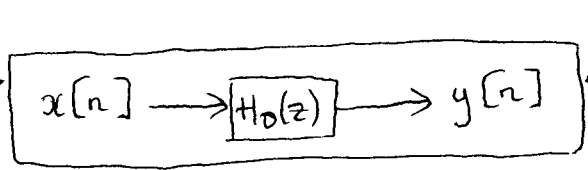
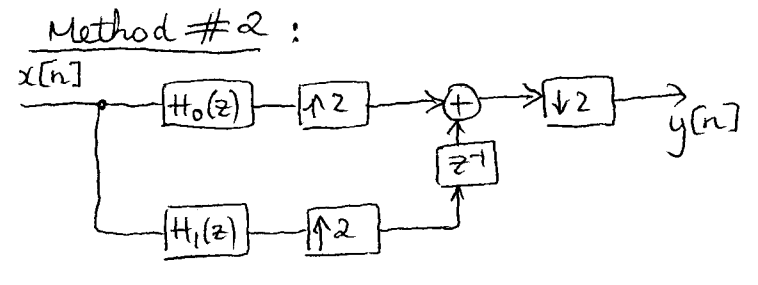
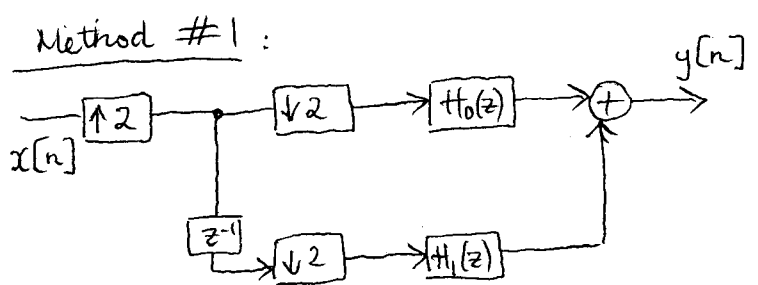
$H_0(z^4) = 1 + z^{-4}$	$H_0(z) = 1 + z^{-1}$
$z^{-1} H_1(z^4) = z^{-1} - z^{-5}$	$H_1(z) = 1 - z^{-1}$
$z^{-2} H_2(z^4) = 2z^{-2} + z^{-6}$	$H_2(z) = 2 + z^{-1}$
$z^{-3} H_3(z^4) = -z^{-3}$	$H_3(z) = -1$

$$H(z) = \sum_{k=0}^3 z^{-k} H_k(z^M)$$

$M=4$



$$H_0(z) = 1 + 2z^{-1} + 1z^{-2} + z^{-3} ; H_1(z) = 1 + (-z^{-1}) - z^{-2}$$



Since the second branch results in an all-zero output sequence. /.