UNIVERSITY OF SASKATCHEWAN
ELECTRICAL ENGINEERING 455.3

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Assignment Quiz 3
October 10, 1997

Instructor: B.L. Daku
Time: 15 minutes
Note: No aids

Name:
Student Number:

1. If

$$x(n) = \{\ldots, 0, 1, 2, 1, 1, 3, 4, 1, 0, \ldots\}$$
$$\uparrow$$
$$y(n) = \{\ldots, 0, 1, 4, 3, 1, 1, 2, 1, 0, \ldots\},$$
$$\uparrow$$

what is the simplest equation for $y(n)$ in terms of $x(n)$?

$\boxed{y(n) = x(-n-2)}$

$x(-n) = \{0, 1, 4, 3, 1, 1, 2, 1, 0\}$

$x(-n-2) = \{0, 1, 4, 3, 1, 1, 2, 1, 0 \ldots\}$

$= y(n)$

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2. Compute the convolution $y(n) = x(n) * h(n)$ of

$$x(n) = \sum_{k=-\infty}^{n} \delta(k) - u(n-4)$$
$$h(n) = \sum_{k=0}^{\infty} \delta(n-k-2) - u(n-8) + u(n-11) - u(n-17)$$

$\delta(k) = \{0, 1, 0\}$

$u(n-4) = \{0, 0, 0, 0, 1\}$

$\therefore x(n) = \{0, 1, 0, 0, 0, -1\}$

$\delta(n-k-2) = \{0, 0, 1, 0\}$

$u(n-8) = \{0, 0, 0, 0, 0, 0, 0, 1\}$

$u(n-11) = \{0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1\}$

$u(n-17) = \{0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1\}$

$\therefore h(n) = \{0, 0, 1, 0, 0, 0, 0, 0, -1, -1, -1, -2, -2, -2, -2, -2, -3\}$

$h(-n) = \{-3, -2, -2, -2, -2, -2, -2, -1, -1, -1, 0, 0, 0, 0, 1, 0, 0\}$

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$y(n)$	0	0	1	0	0	0	-1	-1	-1	-1	-1							
n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

* out of time

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Assignment Quiz 4
October 20, 1997

Instructor: B.L. Daku
Time: 15 minutes
Note: No aids

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Name:
Student Number:

1. Evaluate the convolution, $y(n) = (n+1)u(n) * \delta(n-1)$, giving the result in equation form with no summation symbols. Show all your work.

$y(n) = (n+1)\,u(n) * \delta(n-1)$ — sub $(n-1)$ in for n

$= ((n-1)+1)\,u(n-1)$

$\boxed{y(n) = n\,u(n)}$

$y(n)$	0	1	2
n	0	1	2

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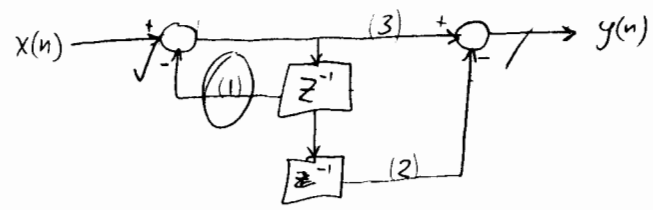
2. Determine the direct form II realization for the system

$$y(n) + y(n-1) - 3x(n) + 2x(n-2) = 0.$$

$y(n) = -y(n-1) + 3x(n) - 2x(n-2)$



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