

Name: \_\_\_\_\_

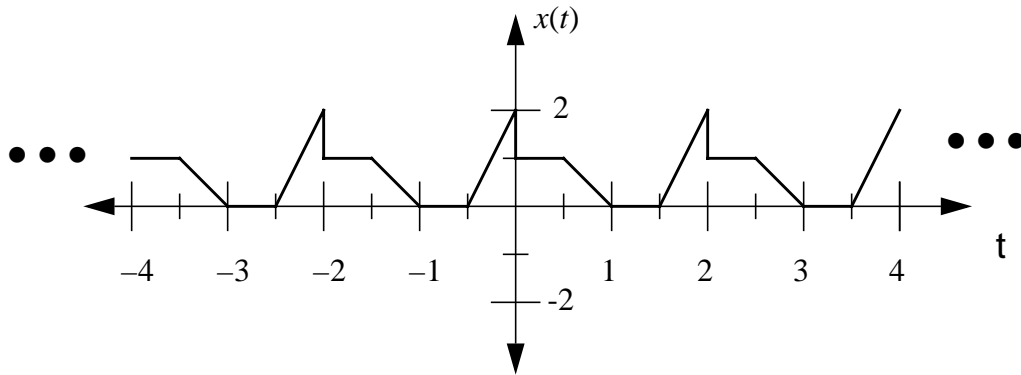
Problem	Points	Score
1a	10	
1b	10	
1c	10	
2a	10	
2b	10	
2c	10	
3a	10	
3b	10	
3c	10	
3d	10	
Total	100	

Notes:

1. The exam is closed books/closed notes - except for one page of notes.
2. Please show ALL work. Incorrect answers with no supporting explanations or work will be given no partial credit.
3. Please indicate clearly your answer to the problem.

I hereby promise not to discuss this exam with anyone in the MWF section of EE 3133.

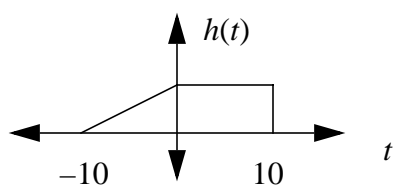
Signature: \_\_\_\_\_

**Problem No. 1: Signal Models**

(a) Express the waveform shown above in terms of  $u(t), r(t), \Pi(t)$ :

(b) Is  $x(t)$  an energy signal or a power signal? Explain.

(c)  $y(t)$  is the output of the convolution of  $x(t)$  in (a) and  $h(t)$  :



Is  $y(t)$  (circle all that apply):

(2 pts) Continuous-time

Discrete-time

(2 pts) Continuous amplitude

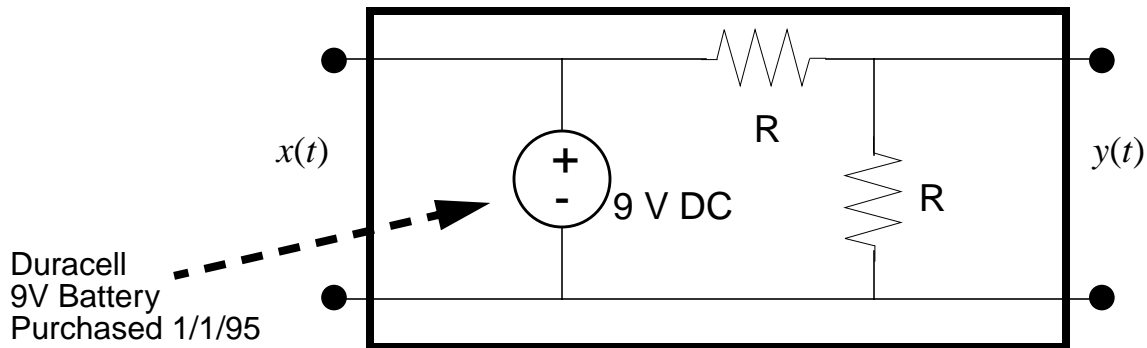
Quantized in amplitude

(6 pts) Periodic

Aperiodic

**Problem No. 2: Linear Systems**

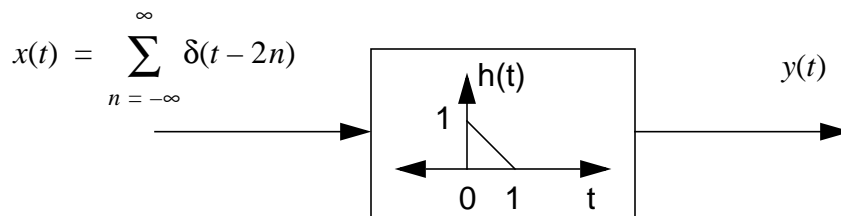
(a) Is the system shown below:



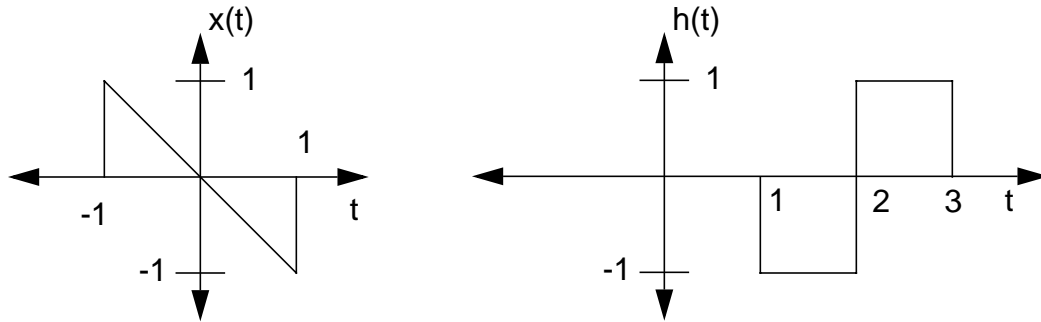
Linear? Explain.

Time-varying? Explain.

(b) Find  $y(t)$ :

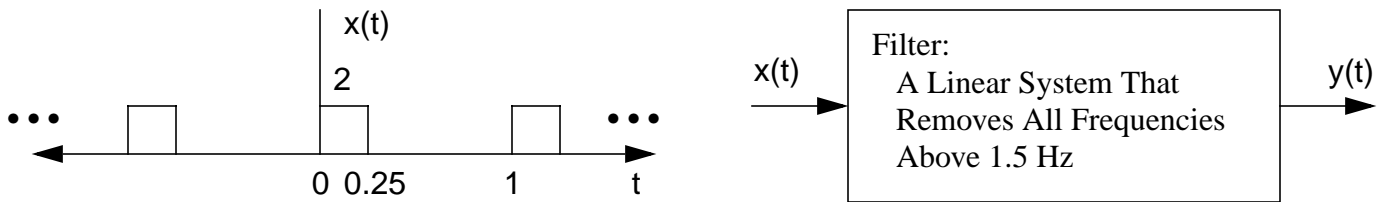


(c) Sketch the output of the system show below:



**Problem No. 3: Fourier Series**

For the signal and system shown below:



(a) Compute the DC value of the output:

(b) Compute the output  $y(t)$ :

(c) Compute the energy and power of  $y(t)$ :

(d) Discuss the differences in the spectra of the signal shown below and  $x(t)$ .

