

GEORGIA INSTITUTE OF TECHNOLOGY  
School of Electrical Engineering

RESERVE DESK

SEP 27 1995

Quiz #1

Date: July 21, 1994

Course: EE 3230

Name: \_\_\_\_\_  
Last, First

- Closed book, closed notes, one  $8\frac{1}{2}'' \times 11''$  handwritten sheet is allowed. Eighty minute time limit.
- None of the problems require involved calculations. Reconsider your approach before doing something tedious.
- All work should be performed on the quiz itself. If more space is needed, use the backs of the pages.

<i>Problem</i>	<i>Score</i>
1	
2	
3	
4	
5	
Total	

**Problem 1:** (20 points)

Evaluate the following integrals

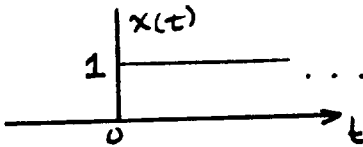
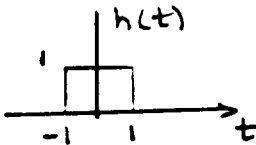
(a)  $\int_{-\infty}^{\infty} \sin(t) \delta\left(t - \frac{\pi}{2}\right) dt$

(b)  $\int_0^{\infty} \cos(t) \delta(t + 1) dt$

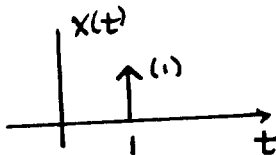
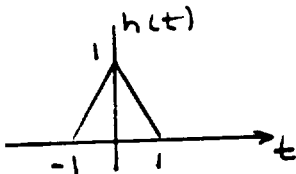
**Problem 2: (20 points)**

Find and sketch  $y(t) = h(t) * x(t)$  for each of the following pairs of signals.

(a)

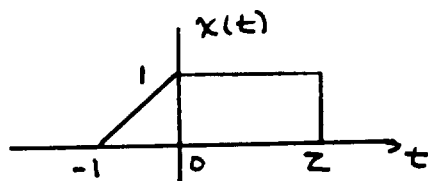


(b)



**Problem 3: (20 points)**

Given  $x(t)$  as drawn below, sketch and label each of the following signals.



(a)  $y(t) = x(-2 - t)$

(b)  $y(t) = Ev\{x(t)\}u(t)$

**Problem 4: (20 points)**

(a) Classify the following two systems in terms of memory, linearity, time-invariance, causality, and stability.

(i)  $y(t) = x(t)x(t - 1)$

(ii)  $y(t) = x(t)\sin(t)$

(iii)  $y(t) = x(t) * \sin(t - t_o)$  ( $t_o$  is fixed)

(b) Classify the linear, time-invariant (LTI) systems corresponding to the following two impulse responses in terms of causality and stability.

(i)  $h(t) = tu(t + 1)$

(ii)  $h(t) = u(t) - u(t - 10)$ .

**Problem 5: (20 points)**

All of the Fourier transforms used below are related. Fill in the blanks in the following table:

$x(t)$	$X(\omega)$
$e^{-t}u(t)$	
	$\frac{1}{j\omega + 2 - 2j}$
	$\frac{e^{j3\omega}}{j\omega + 3}$
$\frac{1}{jt + 1}$	