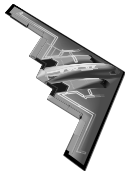
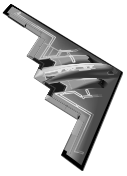
O K L A H O M A S T A T E U N I V E R S I T Y

SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING



ECEN 3723 Systems I
Fall 2008
Midterm Exam
October 23, 2008



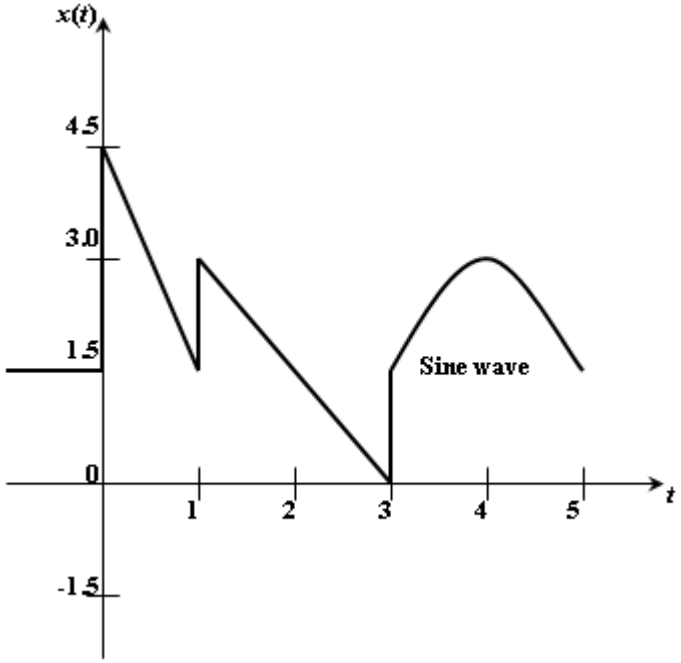
Choose any four out of five problems.
Please specify which four listed below to be graded:
1)_____; 2)_____; 3)_____; 4)_____;

Name : _____

E-Mail Address:_____

Problem 1:

Describe the following signal, $x(t)$, in terms of some basis functions (e.g., step, impulse, ramp or sinusoidal):



Problem 2:

Find the Laplace transform of

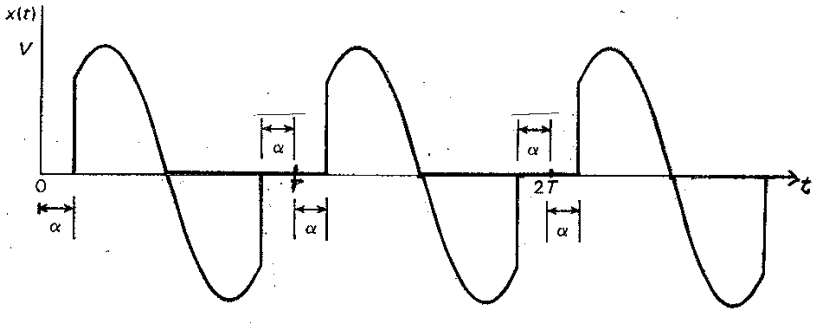
$$\frac{d}{dt} te^{-4t} \cos(\varpi t - \theta)$$

Problem 3:
Find the Inverse Laplace transforms of

$$\int_{s}^{\infty} e^{-4\xi} \ln \frac{\xi + a}{\xi + b} d\xi .$$

Problem 4:

Determine the Laplace transform of the following signal, $x(t)$, with an infinite number of chopped sinusoidal waves.



Problem 5:

A continuous-time system is defined by the input-output differential equation

$$\frac{d^2 y(t)}{dt^2} + 4\frac{dy(t)}{dt} + 3y(t) = 2\frac{d^2 x(t)}{dt^2} - 4\frac{dx(t)}{dt} - x(t),$$

determine the response, $y(t)$, for all $t \geq 0$, when

$y(0^-) = -2$, $\dot{y}(0^-) = 1$, and $x(t) = u(t)$.