

Assignment #9 CE242 : Signals & Systems
Dept. of Computer Engineering
Sharif University of Technology
Fall 2006

Distributed: 9/27

Due: 10/12

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Solve the following problems from Oppenheim:

- 1- 9.27
- 2- 9.32
- 3- 9.34
- 4- 9.48

5- A signal $x(t)$ is given by

$$x(t) = e^{(t+1)} u(t+1) \quad -\infty < t < +\infty$$

- (a) Determine the Laplace transform $X(s)$ of $x(t)$.
- (b) Determine the inverse Laplace transform of $X(s)$.
- (c) Briefly explain any discrepancy between $x(t)$ and inverse Laplace transform of $X(s)$.

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- 1) Given the following z-plane poles and zeros of a transfer function $H(z)$:

Poles	Zeros
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(-0.75)	$0.5 e^{j\pi/2}$
(-0.25)	$0.5 e^{-j\pi/2}$
(0.5)	

- (a) Find the transfer function $H(z)$
- (b) Find the partial fraction expansion of $H(z)$
- (c) Find the discrete time impulse response $h[n]$ assuming a causal system

- 2) Consider the following system transfer function :

$$H(z) = \frac{(z-1)(z+1)}{(z-j)(z+j)(z-2)}$$

- (a) What is the difference equation that describes this system?
- (b) Using the iterative techniques , tabulate the $h[k]$ for $k=1,2,3,4,5,6$.
- (c) Find as simple an expression as possible for $h[k]$.
- (d) Plot the poles and zeros and ROC .Is the system stable?

- 3) Problem 10.7 of the textbook.
- 4) Problem 10.37 of the textbook.
- 5) Problem 10.47 of the textbook.