

Assignment #9 CE242 : Signals & Systems
Dept . of Computer Engineering
Sharif University of Technology
Spring 2006
Due: 3/10

1) Calculate Z-Transform of $x[n]$ and determine its ROC.

$$x[n] = 2^n u[-n] + \left(\frac{1}{4}\right)^n u[n-1]$$

2) A LTI system has Difference equation as below,

$$y[n] - \frac{3}{2}y[n-1] - y[n-2] = 3x[n] - x[n-1]$$

- a. Calculate $H(z)$ and plot the zeros and poles of system.
- b. Determine all possible impulse responses and their stability and causality of them.
- c. Calculate the response of causal system to inputs

$$x_1[n] = 3^n, x_2[n] = 3, x_3[n] = 3^{-n}$$

3) If $y[n] = x[2n]$ calculate $Y(z)$ in term of $X(z)$