



ISRA UNIVERSITY

Islamabad Campus

Department of Electrical Engineering

Program: B.E. (Electrical)

Semester - Fall 2016

EL313- Signal & Systems

Quiz – 5

Marks: 20

Handout Date: 04/01/2017

Question # 1:

Using partial fraction expansion and the fact that:

$$(a)^n u[n] \leftrightarrow \frac{1}{1-az^{-1}}, \quad |z| > |a|$$

Find the inverse z-transform of:

$$X(z) = \frac{1-z^{-1}}{1-\frac{1}{4}z^{-2}}, \quad |z| > \frac{1}{2}$$

Also, determine whether the system is causal or stable or both?

Question # 2:

Consider the linear discrete-time, shift invariant system with input $x[n]$ and output $y[n]$ for which:

$$y[n - 1] - \frac{10}{3}y[n] + y[n + 1] = x[n]$$

The system is stable. Determine the unit sample response i.e., $h[n]=?$

(Hint: For a stable system ROC must include the unity circle. So, do focus on the poles and ROC for determining the unit sample response.)

Question # 3:

Draw a parallel-form block diagram representation for S based on the observation that:

$$H(z) = 4 + \frac{\frac{5}{3}}{1 + \frac{1}{2}z^{-1}} - \frac{\frac{14}{3}}{1 - \frac{1}{4}z^{-1}}$$

Good Luck