UESTC Student ID_____ UOG Student ID_____ Course Title_____ Lecturer_____

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Glasgow College, UESTC

Signals and Systems—Semester 2, 2017 - 2018

Quiz 4

Jun, 2018

Notice: Please make sure that both your UESTC and UoG Student IDs are written on the top of every sheet. This examination is closed-book and the use of a cell phone is not permitted. All scratch paper must be adequately labeled. Unless indicated otherwise, answers must be derived or explained clearly. Please write within the space given below on the answer sheets.

All questions are compulsory. There are 1 question and a maximum of 100 marks in total.

The following table is for grader only:

Question	Grader
Score	

Score

Question

Given the causal digital filter structure shown in Fig.1 ,where k is a real constant.

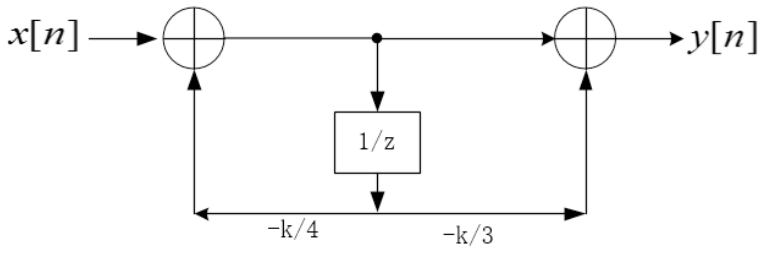

Figure 1

(a) Determine the system function $H(z)$ and the difference equation relating y[n] and x[n].

(b) Find the unit sample response h[n]. For what values of the k is the system stable?

(c) If k=1 and $x[n] = (\frac{2}{3})^n, -\infty < n < +\infty,$ determine y[n].

(d) Determine y[n] if k=2 and $x[n] = (\frac{2}{3})^n u[n].$