

GEORGIA INSTITUTE OF TECHNOLOGY
SCHOOL of ELECTRICAL and COMPUTER ENGINEERING
ECE 2026 – Fall 2014 Quiz 3 (Clicker 2)

October 31, 2014

Student Name: _____ GT ID #: _____ Clicker ID: _____

Instructions:

1. A calculator and one sheet of paper of letter size with hand-written notes are allowed;
2. Clear everything other than the single sheet note and a calculator on the desk;
3. Use your clicker to enter your answers;
4. Circle your answers on your test which is to be turned in at the end of test; this is a backup in case your clicker does not function properly;
5. A duration of twenty five minutes has been allocated for this test.

A. Use Clicker to Enter Test Version #: This is Version #1

B. Test Problems

Problem 1-4 are related to sampling and reconstruction as depicted in Figure 1 with the input signal $x(t)$ specified therein. Problem 5 is related to FIR systems.

$$x(t) = \cos(240\pi t + 0.2\pi) + \cos(320\pi t + 0.8\pi)$$

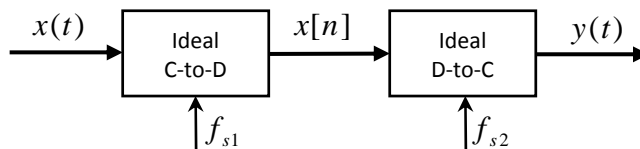


Figure 1

1. Pick the sampling rate (samples/s) of the ideal C-to-D from the list below such that $x[n]$ is a constant:

A	B	C	D	E	F	G
160	320	80	120	180	40	200

2. Let $f_{s1} = 200, f_{s2} = 300$ samples/s, respectively. What is the fundamental frequency (in Hz) of $y(t)$?

A	B	C	D	E	F	G
100	80	120	10	20	40	60

3. If $f_{s1} = 720$ samples/s, what is the period of $x[n]$ in samples?

A	B	C	D	E	F	G
20	12	10	16	24	36	18

4. A student writes the following MATLAB code to generate and play a signal:

```
tt=0:1/2400:4; xx=sin(2*pi*10800*tt + pi/3); soundsc(xx,3000);
```

Determine the frequency (Hz) of the tone that is heard.

A	B	C	D	E	F	G
1000	600	900	1800	800	1200	1500

5. A linear time-invariant system is defined by the following impulse response:

$h[n] = \delta[n] - \delta[n-1] + \delta[n-2]$. Let the input signal be a periodic sequence with period 4 defined for $n = 0, 1, 2, 3$ as $[1 -1 -1 1]$. Find the value of output at $n = 10$, i.e., $y[10]$, from the table below.

A	B	C	D	E	F	G
-1	1	3	0	-2	2	-3