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**Lab 8: Convolution TIMS Week 1 Answer Sheet**

Part 1. 2. Demonstrate the Sync function outputting one pulse every 32 pulse periods.

* Show to GTA

Part 2. Question 1. Measure and record the amplitude of each pulse in the output sequence. Label them as h[0], h[1], and h[2].

* h[0] = 265.3 mV
* h[1] = 430.2 mV
* h[2] = -203.8 mV

Part 3. 1. Draw h[n] from part 2 to scale in the lab notebook.

2. Draw h[n] from part 2 shifted later in time by one time step.

3. Draw the h[n] graphs superimposed on each other from part 3.

Diagram, schematic

Description automatically generated

4. Explain how the shifted and superimposed graphs from part 2 equal that of part 3.

* You can see how it is equal by taking the value of H[n] and adding it to the value at H[n-1] this will be equal to the value of the superimposed graph.

Part 4. Record the peak to peak voltage and frequency of ARB 1.

* ARB1 = 2V Pk to Pk approx. 100 Hz

Part 4. Question 2. Explain why the half wave rectified sine amplitude is different than its input.

* The input and output appear to be the same, however, the output is going through a SAMPLE/HOLD function which takes the input and grabs a sample at a specific time then gives that as the output until another sample is requested.

Part 4. 5. Sketch the original half wave rectified sinusoid and the discrete output from the S/H.

A picture containing diagram

Description automatically generated

Part 4. 5. Explain the function of the S/H in your own words.

* The SAMPLE/HOLD function takes an input and every x amount of seconds grabs a measurement of the input and returns that value as the output until another measurement is requested. Or it does this in reverse.

F.1. What did you enjoy about this lab?

* + This lab really helps to understand the importance convolution and how much easier it is to use TIMS to simulate it over calculations by hand.

F.2. What didn’t go well in this lab?

* + This lab did not explain very well how to hook up the machine and also contained no pictures. It is explained very poorly, and I found myself not knowing what to do until asking to TA for clarification. After it was clarified however it became a simple lab.

F.3. How would you improve the lab experiment for future classes?

* + Change the procedures to be much more like the others before this. All the other labs until now have told you exactly what to do and how to check if you are doing it right.