

Experiment 4: FIR Filters - Answer Book

• Name:	Lab Date:	
• Student No.:	Day of the week:	Time:
• Name:	TA Signature:	
• Student No.:	Grade:	

3. Experiment

3.1 FIR: Design

- Having set all parameters, click “view” to select a normalized view, then create a table to compare the amplitude of the first sidelobe for the following windows: Rectangular, Hamming, Hanning and Blackman. Compare your table with the one found on page 471 (Table 7.2) in the textbook.

3.2 FIR: Simulation

- With the model running, change the input frequency and draw the filter frequency response from the output values. In order to do that, you can set the running time to `inf`, as it is in Figure 3. Use 500Hz, 1kHz, 4kHz, 7kHz, 10kHz and 20kHz.



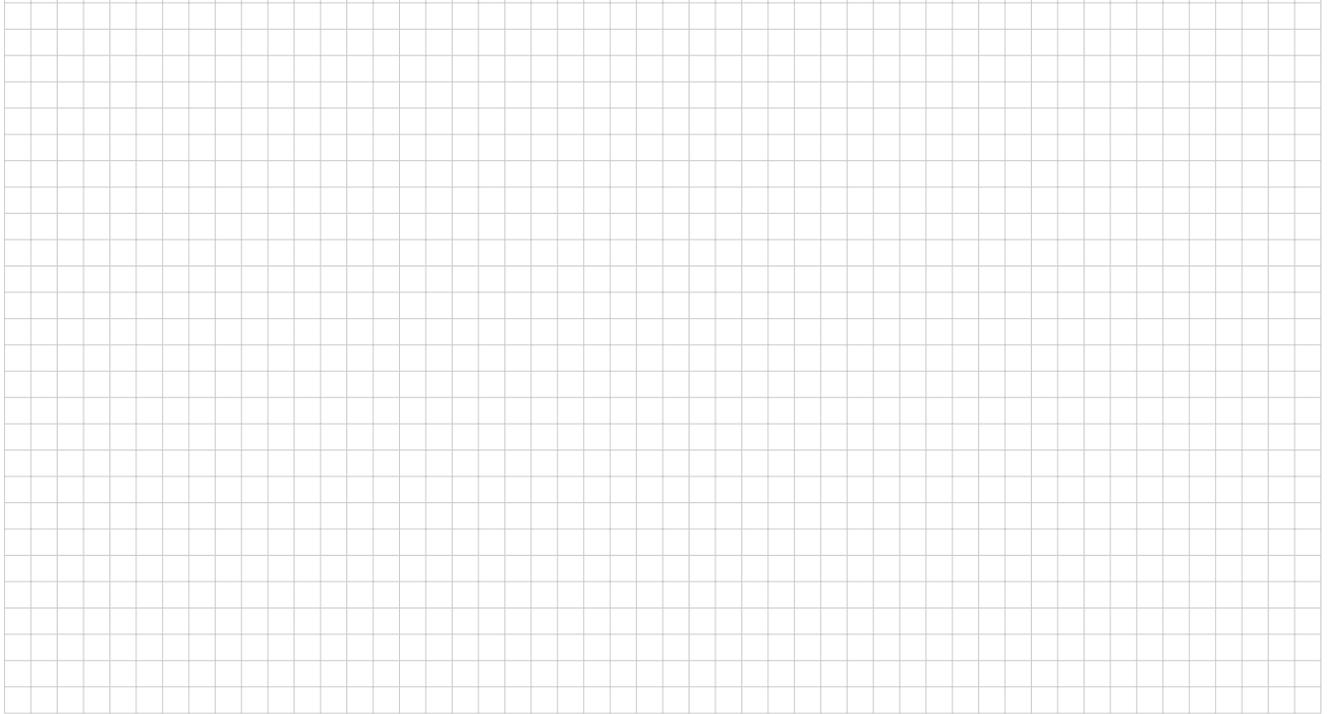
- *Change the order to 40 (i.e., redesign the filter) and repeat the procedure above for 500Hz, 1kHz, 4kHz, 5kHz and 10kHz.*



- *Compare the results from the two steps above, and explain what changes in the response. At what expense would you opt towards a higher order filter?*

4. FIR: Implementation

- *With the filter running on the DSP, change the input frequency and draw the frequency response magnitude. Use 500Hz, 1kHz, 4kHz, 7kHz, 10kHz and 20kHz. Compare these results with the ones obtained in the simulation.*



- *Identify where the first sidelobe is by varying the frequency of your input signal. Show it to the TA.*