University of Tehran

Electrical and Computer Engineering Department

ECE (8101) 342

Object Oriented Modeling of Electronic Circuits – Spring 1401-02

Homework 6A: SystemC AMS Modeling - ELN
Due Date: Khordaad 15

There are applications where a particular band, or spread, or frequencies need to be filtered from a wider range of mixed signals. Filter circuits can be designed to accomplish this task by combining the properties of low-pass and high-pass into a single filter. The result is called a band-pass filter as shown in Figure 1.

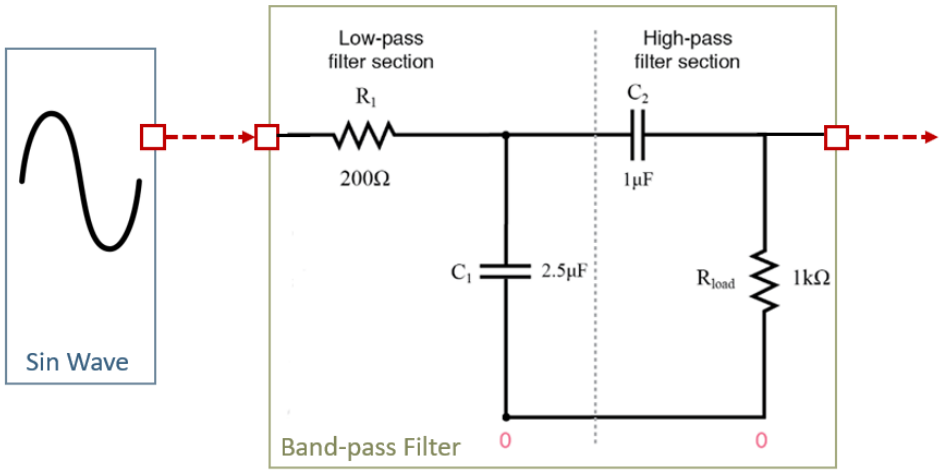

Figure 1 – An overall view of the system

In this homework, you are to

A) Model the band-pass filter shown in Figure 1 in SystemC-AMS using ELN computation model. This module receives a DE double signal as the input and needs a DE to ELN converter in addition to the resistors and capacitances. The output of this module is a DE double signal that needs a sink converter to convert ELN output to a DE value.

B) Write a functional sin wave module in SystemC as source module.

C) Write a testbench and connect the band-pass filter and the sin wave module together.

D) Trace the input and output signals of the filter by generating a VCD file.

Deliverables:

1. All SystemC codes with proper naming
2. A complete report containing
    - Schematic diagrams drawing in Visio or other visualization tools,
    - Enough design illustration and description,
    - Simulation results, input data, and output justification.