ECEN302 : Integrated Digital Electronics
Assignment 2 Submission

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1. ***List three advantages of scaling down the feature sizes of silicon devices.***

   - Higher density means more transistors on a single device
   - Smaller distance means faster propagation tome and lower power loss.
   - Smaller sized dies can be run faster and cooler

2. ***List two consequences of scaling down the feature sizes of silicon devices.***

   - As feature sizes decrease the sum effect of slow atomic diffusion through the semiconductor material decrease the time until the device is unusable.
   - At smaller and smaller "trace" sizes the risk/probability of electrons quantum tunnelling becomes significant.

3. ***Briefly discuss and compare the performance and typical uses of microprocessors and FPGAs.***

4. ***List four advantages of integrating a microprocessor and an FPGA onto a single chip.***

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5. ***Provide one application or product example that benefits from having both a microprocessor and a FPGA.***

6. ***In a RF receiver signal chain, why is it advantageous to have the ADC as close as possible to the Antenna?***

7. ***Describe the operation of the OSERDES and ISERDES FPGA I/O blocks.***

8. ***Describe, with the aid of diagrams, how you would connect the AD9739 DAC to a Xilinx 7 series device and run the DAC at 2GSPS (note: you do not need to create a detailed schematic diagram).***