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Question Paper Code : 11918

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Elective

Applied Electronics

VL 9253/10244 VLE 61 — VLSI SIGNAL PROCESSING

(Common to M.E. VLSI Design)

(Regulation 2009/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Name two advantages of digital signal processing over analog.

2. What is iteration bound?

3. Prove that retiming does not change the number of delays in a cycle.

4. Draw the fine grain pipelined version of 3 tap FIR and calculate its critical path computation time.

5. Compare efficient single channel interleaving and multichannel interleaving in digital filters.

6. How does clustered look a head pipelining increase the sample rate by a factor M?

7. What are scaling and round off noise in a digital circuit?

8. State the properties of CST number representation.

9. What is iterative matching?

10. What are the effects of clock skew on synchronous sytems?

PART B — (5 × 16 = 80 marks)

11. (a) Explain with suitable example the longest path matrix algorithm to compute iteration bound.

Or

(b) Explain how pipelining and parallel processing help to realize low power circuits.

12. (a) (i) Describe an algorithm for unfolding.

(ii) Write a note on DCT architecture.

Or

(b) (i) Discuss the implementation of 2-parallel FIR and two-parallel fast FIR filters with neat diagrams and expressions.

(ii) Write briefly about unfolding.

13. (a) Construct a 3 × 3 convolution algorithm using modified cook toom algorithm with $'\beta_i's$ as 0, 1, –1, 2, –2. Mention the merits of pipelined and parallel recerisive filters.

Or

(b) Explain the register minimization in folded architecture for an IIR filter that computes.

$y(n) = ay(n-3) + by(n-5) + x(n)$.

14. (a) Discuss round off noise in pipelined IIR filters.

Or

(b) Discuss Lyon's but serial multiplier.

15. (a) With examples, show how subexpression elimination is applied to multipliers to reduce hardware.

Or

(b) Explain the wave-pipelined architecture and discuss on its limitation and advantages.

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