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Question Paper Code : 66320

M.E. DEGREE EXAMINATION, DECEMBER 2015/JANUARY 2016

First Semester

VLSI Design

VL7101 – VLSI Signal Processing

(Common to M.E. Electronics And Communication Engineering)

(Regulations : 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART A – (10 × 2 = 20 Marks)

1. What are the requirements of DSP Technology ?
2. Define repetition rate in the context of field programmable logic and what is its importance ?
3. What are the methods to increase the speed of DA architecture ?
4. How speed of a design can be increased ?
5. What are the properties of a real filter ?
6. Represent the magnitude-squared frequency response of a Type-I Chebyshev filter.
7. Define the convolution process of a linear time invariant filter.
8. How a transposed FIR filter is obtained from a FIR filter ?
9. What are the advantages of strength reduction ?
10. What are the advantages of DCT in terms of power reduction ?

PART – B (5 × 13 = 65 Marks)

11. (a) List various Digital signal processing applications and various DSP algorithms used in the applications.

OR

- (b) Explain the classification of field programmable logic based on Granularity.

12. (a) With a neat diagram, explain working of Modulo Adders.

OR

- (b) Draw a $N \times N$ bit-multiplier in programmable digital signal processors and Distributed Arithmetic and make a comparison.

13. (a) Why pipelining can be difficult to implement in IIR filters ? How the speed of a IIR filter can be improved ?

OR

- (b) Compare important IIR design attributes of Butterworth, Chebyshev I, Chebyshev II, and Elliptic filters.

14. (a) Design Pipelined FIR filter with coefficients $\{-1, 3.75, 3.75, -1\}$.

OR

- (b) Explain redundant arithmetic. How redundant numbers are represented ?

15. (a) Explain various components of power in a VLSI logic circuit.

OR

- (b) Explain various low-power techniques used in VLSI circuit design.

PART – C (1 × 15 = 15 Marks)

16. (a) Explain bit level arithmetic architecture of Digital lattice filter.

OR

- (b) What are advantages and disadvantages of FIR filter and IIR filter ?