Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject Code: 725404 **Date: 20-06-2014**

Subject Name: Embedded and VLSI Signal Processing

Time: 02:30 pm - 05:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	How to get linear convolution from circular convolution? Explain circular convolution with the help of an example.	**07**
	(b)	Define the following terms: 1. INL 2. DNL 3. Noise Margin 4. Yield 5. Power Dissipation 6. Photolithography 7. Power Signal	**07**
Q.2	**(a)**	Write a VHDL code using behavioral description for four-bit shift register which has following features: 1. Parallel load, 2. Left shift and 3. Right shift.	**07**
	(b)	What is VHDL? List major capabilities of VHDL along with the features that differentiate it from other hardware description languages.	**07**
		OR	
	(b)	Explain Structural Model of VHDL and Write VHDL code for Master-slave flip flop using Structural Modeling in which JK flip flop is used as a component.	**07**
Q.3	**(a)**	Write VHDL code for 1K X 8 RAM with separate input and output buses	**07**
	(b)	Explain Xilinx 3000 series logic cell with its configurable logic blocks.	**07**
		OR	
Q.3	**(a)**	Explain Programmable Logic devices. Also Give Comparison between PAL, PLA, CPLD and FPGA.	**07**
	(b)	Write a VHDL Code for 4 ï Bit full-adder using structural modeling style take 1- Bit full adder as a component.	**07**
Q.4	**(a)**	Explain the VLSI Design flow in brief. Also compare Full custom and Semi-custom design style.	**07**
	(b)	Write a VHDL code for 4-Bit Parallel-In-Serial-Out Shift Register.	**07**
		OR	
Q.4	**(a)**	What is the need for floor planning and Placement tools? Discuss the core objectives and goals of Floor Planning.	**07**
	(b)	Explain data types used in VHDL. List all possible level that can be assigned to std_logic data type.	**07**
Q.5	**(a)**	Explain the Z transform and Inverse Z transform with the properties of ROC. Also briefly discuss any two properties of Z transform	**07**
	(b)	Differentiate between FFT & DFT. Draw Decimation in Frequency FFT algorithm.	**07**
		OR	
Q.5	**(a)**	Compare FIR and IIR filters. What is the principle of designing FIR filter using windows method?	**07**
	(b)	Explain in detail sampling and reconstruction theorem with aliasing effect and suggest the way to overcomes it.	**07**

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