Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME SEMESTER II EXAMINATION – SUMMER 2017

Subject Code: 2725406 **Date:29/05/2017**

Subject Name: Embedded and VLSI Signal Processing

Time:02:30 PM to 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)**	What is VHDL? List major capabilities of VHDL along with the features that differentiate it from other HDL. And also list out advantages and limitations of VHDL	**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 the VHDL code for Sequence detector for detecting "0110"	**07**
	(b)	Explain Xilinx 3000 series logic cell with its configurable logic blocks.	**07**
		OR	
	(b)	Write the VHDL code to implement ALU with given specification. a) There are two data each of 4 bits and two bits control line b) If control is '00' must do addition,'01' substraction,'10' multiplication,'11' division Assume data is available parallel	**07**
Q.3	**(a)**	List out different properties of Linear Time Invarient System and explain each with suitable example,	**07**
	(b)	What are the problem associated with placement? Explain any one placement algorithm.	**07**
		OR	
Q.3	**(a)**	Explain Programmable Logic devices. Also Give Comparison between PAL, PLA, CPLD and FPGA.	**07**
	(b)	Differentiate between FFT & DFT. Draw Decimation in Frequency FFT algorithm.	**07**
Q.4	**(a)**	Explain in detail sampling and reconstruction theorem with aliasing effect and suggest the way to overcomes it.	**07**
	(b)	What is an IIR digital filter? Compare an IIR filter with an FIR filter.	**07**
		OR	
Q.4	**(a)**	What are the different design techniques available for IIR filter.	**07**
	(b)	Discuss process flow for the fabrication of an n-type MOSFET on p-type Silicon (n well process).	**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)	Define ACF (Auto-Correlation Function) of a sequence; explain ACF main properties and relation with the Power Spectral Density of the sequence.	**07**
		OR	
Q.5	**(a)**	Explain shifting, folding and time scaling operations on discrete time signals.	**07**
	(b)	Explain impulse response. Determine the transfer function & impulse response Of a discrete time LTI system describe as y (n) = 1/2y (n-1) +x (n) +1/3x (n-1)	**07**