Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(New course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 2724209 **Date: 10/12/2015**

Subject Name: VLSI Signal Processing

Time:2:30 pm to 5:00 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)** 1. What do you understand by Digital Signal Processing versus VLSI Signal processing? (2 Marks) **07**

2. Which algorithms are used for computing iteration bound? (1 Mark)
3. Explain following terms ï (4 Marks)
   - A. Critical Path
   - B. Cutset
   - C. Feed-forward-cutset
   - D. Loop Bound

(b) Discuss SFG, DFG and Dependence Graph for representing algorithm **07**

Q.2 **(a)** Discuss application of parallel processing for low power implementation of a given sequential structure using suitable example. **07**

(b) Compute iteration bound of the system, represented by DFG given in Figure 1 using LPM technique. **07**

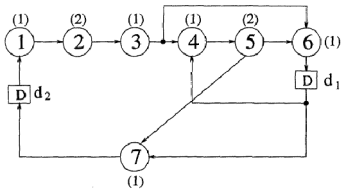


Figure 1

OR

(b) Transform MRDFG given in Figure 2 to SRDFG. **07**

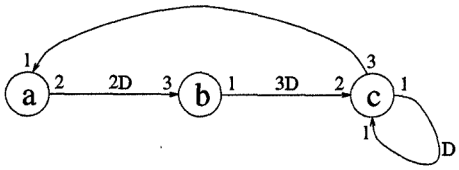
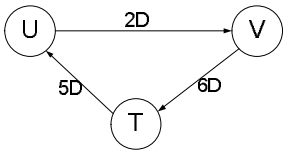


Figure 2

Q.3 **(a)** Explain scaling versus power consumption. **07**

(b) Apply the unfolding technique to below given DSP algorithm with unfolding factor equal to 4. **07**



OR

Q.3	**(a)**	What are the properties of retiming?	**07**
	(b)	Prove that Unfolding preserves the number of delays in a DFG.	**07**
Q.4	**(a)**	What is the need for systolic architecture design? Discuss systolic architecture design in detail.	**07**
	(b)	Write a note on look ahead computation.	**07**
		OR	
Q.4	**(a)**	Explain bit level arithmetic architecture.	**07**
	(b)	What is algorithmic strength reduction? Write a short note on Fast Convolution.	**07**
Q.5	**(a)**	Discuss important features of any latest DSP processor.	**07**
	(b)	List and discuss common DSP algorithms and their applications.	**07**
		OR	
Q.5	**(a)**	Discuss redundant number representation. Give example of nonredundant representation.	**07**
	(b)	Explain multirate systems using example.	**07**

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