Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II EXAMINATION – SUMMER 2015

Subject Code:2725402 **Date: 01 /06 /2015**

Subject Name: DIGITAL SIGNAL PROCESSORS: ARCHITECTURE AND PROGRAMMING

Time:2:30 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 the use of host port in P-DSPs? How do they differ from comm ports? List the relative merits and Demerits of RISC & CISC Processors.	**07**
	(b)	Briefly discuss how floating point addition and multiplication are performed? Perform binary multiplication of following in Q.3 Format: (1) - 0.5 × 0.875 (2) - 0.375 × - 0.625. Determine Quantization error in storing result using Q.6 Format.	**07**
Q.2	**(a)**	Explain How numbers are represented in different fixed point and floating point processor considering dynamic range and precision? How fractional number 1.18 is converted in to Q.15 format?	**07**
	(b)	Discuss Real time implementation Consideration used in DSP.	**07**
		OR	
	(b)	Explain difference between Von Neumann & Harvard Architecture. Which Architecture is preferred for DSP Application? Also explain different techniques adopted for increasing the number of memory access per instruction cycle.	**07**
Q.3	**(a)**	Explain functional block diagram of TMS320C54x Processor.	**07**
	(b)	How indirect addressing modes can be used with (1) Offset address generation (2) index address generation (3) Circular Addressing (4) Bit reversal addressing. Discuss with suitable example.	**07**
		OR	
Q.3	**(a)**	Explain Central Processing Unit in TMS320C54x Processor.	**07**
	(b)	Discuss different Multiply and Accumulate instruction used in 54x Processor. Also discuss special instructions used in 54x processor.	**07**
Q.4	**(a)**	Write a detail note on CPU of TMS320C67x DSP with its functional unit and its operations.	**07**
	(b)	Explain different instructions used for conversion of data formats in TMS320C67x.	**07**
		OR	
Q.4	**(a)**	Write note on structure of datapaths for TMS320C67x processor.	**07**
	(b)	Explain different pipelining operations performed in 67x processor in detail.	**07**
Q.5	**(a)**	Write a short note on applications of FIR Filter.	**07**
	(b)	How convolution is performed in DSP processor? Write C program to perform the same in floating point processor.	**07**
		OR	
Q.5	**(a)**	Write a short note on applications of adaptive filter.	**07**
	(b)	Explain different on chip peripherals used in P-DSPs.	**07**

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