Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2712608 **Date: 04/01/2016**

Subject Name: Digital Signal Processors: Architecture and Programming

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)** Do as directed.

(i) List the hardware features of C6x series of Digital Signal Processors. **03**

(ii) Enlist the major difference between the 64x and 67x family of processors. **02**

(iii) "Pipeline is used to speed up instruction execution" Justify the statement. **02**

(b) Explain TMS320C67x processor CPU data paths in detail with block diagram. **07**

Q.2 **(a)** Explain following TMS320C67x processor instructions with an example and list one specific scenario where it is appropriate. **07**

(i) MPYH (ii) INTDP

(b) Explain in detail double precision floating point data representation. Convert $(-111.3)_5$ number and (0x48633000) SP floating point number into double precision floating point data. **07**

OR

(b) Explain in detail addressing modes of TMS320C67x processor. Configure C67x processor for circular addressing mode with: (i) Buffer size 4 KB, size field-0, register A4 and (ii) Buffer size 1 MB, size field-1, and register B6. **07**

Q.3 **(a)** What you mean by resource constraints? Explain cross path and load/store constraints in detail. **07**

(b) Describe the significance of ISR and ICR control registers. Write short code to Set and Clear individual interrupt INT5. **07**

OR

Q.3 **(a)** Explain in brief about pipelining with stalling effect for FP-1 with three EPs, FP-2, FP-3 and FP-4 each contains two EP. **07**

(b) Write short note on interrupts of TMS320C67x processor. **07**

Q.4 **(a)** Write an assembly language program using C67x processor to find even number among randomly stored TEN words from memory location 1000H onwards. Store result to location 2000H. **07**

(b) Write short note on : (i) EDMA (ii) EMIF **07**

OR

Q.4 **(a)** Write an assembly language program using C67x processor to find numbers of negative data among randomly stored EIGHT half-words from memory location 2000H onwards. Store result to location 3000H. **07**

(b) Write short note on : (i) McBSP (ii) Timers **07**

Q.5 **(a)** Write a C program using C67x processor that calls an assembly function, named findFacto to compute: $y = \Sigma\, x!$, where $x = 1$ to 6. **07**

(b) Explain with example how code optimization helps us for DSP system design. **07**

OR

Q.5 **(a)** Write a C program that calls a linear assembly function named addArray to make addition of two arrays having size of FIVE elements. **07**

(b) Write short note on DTMF Signal detection. **07**

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