(Following Paper ID and Roll No. to be filled in your Answer Books)

PAPER ID : ME16

Roll No. | | | | | | | | | | |

M. TECH. (Sem.II)

THEORY EXAMINATION 2015-16

DSP ARCHITECTURES AND APPLICATIONS

Time : **3** Hours   Total Marks : **100**

SECTION-A

1.   Attempt all parts. All parts carry equal marks. Write answer of each part inshort.   (2×10=20)

   (a)   What are interrupts? How are interrupts handled in C54XX processors.

   (b)   What are the special addressing modes in P-DSP?

   (c)   Define OMAP.

   (d)   Compare SRAM & DRAM characteristics

   (e)   Define Decimation and Interpolation process.

   (f)   What is meant by circular addressing mode?

   (g)   Define Host Port Interface.

(h)   Define the .global & .bss assembler directives.

(i)   What is an interpolation filter?

(j)   Define Signal Spectrum.

SECTION-B

2.   Attempt any five questions from this section.   (10×5=50)

(a)   Derive an expression for interpolation by a factor I, a process of sampling rate conversion both in time and frequency domain.

(b)   Compute the dynamic range and the percentage resolution for a block floating point with a 4-bit exponent used in a 16-bit fixed point processor.

(c)   (i)   Explain how bit reversed addressing is achieved in TMS320C54XX Processor.

       (ii)   Implement an 8-Point FFT on TMS320C54XX Processor.

(d)   Explain the mode control interface signal timing for the PCM3002 CODEC.

(e)   (i)   Explain the following instructions used in 54XX

STM   #100h, T

MPY   *AR1, A

MPYU   *AR1, B

MPY   *AR2, #100h, A

LD   #1000h, 16, A

MPYA   B

(ii) Explain the importance of Q notation. Convert 1.18 using Q15 format.

(f) Design a data memory system with address range 000800h – 000FFFh for a C5416 processor using 2K x 8 SRAM memory chips.

(g) Describe DMA with respect to TMS320C54XX processors.

(h) Explain, how scaling prevents overflow conditions in the butterfly computation.

SECTION-C

3. Attempt any two questions from this section.   (15×2=30)

(a) (i) Explain the use of decimator and interpolator for filter implementation.

       (ii)   Explain the OMAP architecture for multimedia applications

(b) (i)   Explain the on-chip peripheral available in C3X.

       (ii)   What is the use of interrupt enable and interrupt flag register in C3X

(c)   What is Distributed Arithmetic algorithm? Explain w.r.t speed the implementation of parallel and serial distributed arithmetic algorithm.

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