GANPAT UNIVERSITY

B. Tech. Sem. VII Electronics & Communication Engineering
Regular Examination November-December 2011

EC 702: DSP ARCHITECTURE

Time: 3 Hours   Total Marks: 70

Instructions:
1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

SECTION-I

1 (A) Difference between fixed point and floating point processor. 4

(B) Why digital signal processors is require over general purpose processors. 4

(C) Find the decimal equivalent of floating point binary number (i) 1011000011100, (ii) 111100101110. Assume the format similar to IEEE-754 in which the MSB is the sign bit followed by 4 exponent bits followed by 8 bits for fractional part. 4

OR

1 (A) What is the range of numbers that can be represented in a fixed point format using 8-bits & 16-bits if numbers are treated as (a) signed integers (b) signed fractions. 3

(B) Explain floating point format for number representation in DSP implantations. 4

(C) Explain Decimation and interpolation with examples. 5

2 (A) Explain the multiplier unit for programmable DSP with different issues related to speed and bus width. 4

(B) Explain the MAC unit for programmable DSP and how we can control the overflow and underflow? 7

OR

2 (A) Explain the barrer shifter. 4

(B) Explain the requirements of shifter and discus different cases. 7

3 (A) Explain the implementation of IIR filters algorithm in DSPs. 4

(B) Explain Direct Memory Access operation. 4

(C) Design a interface an 8K x 16 program ROM to the C5416 DSP in the address range 7FE000h – 7FFFFFh. 4

4 (A) Explain the stack addressing. 2

(B) Explain the accumulator of 54xx. 4

(C) Give brief description of direct addressing and indirect addressing. 6

OR

4 (A) List all arithmetic instruction of 54xx, describe instructions for find absolute value. 4

(B) Describe uses of temporary register. 4

(C) Write short not on logical instruction. 4

5 (A) Explain buses of 54xx. 4

(B) Explain MOVE instruction of 54xx. 4

(C) Write a program to compute the sum of three product terms given by the equation. y(n)=h0x(n)+h1x(n-1)+h2x(n-2). Where x(n), x(n-1) and x(n-2) are data samples store at three successive data memory location and h0, h1 and h2 are constants store at three other successive location in the data memory location in the data memory the result y(n) is to be store in the data memory use indirect addressing mode. 3

OR

5 (A) Which type of on-chip peripheral are used in 54xx, describe clock generator. 2

(B) Explain circular addressing mode. 3

(C) Explain DSP based bio telemetry receiver. 6

6 (A) Explain the Q-notation. What values are represented by the 16-bit fixed point number N=4000h in the Q14 and Q8 notations? 2

(B) Explain use of CPU status register bits MP/$\overline{MC}$, OVLY and DROM. 4

(C) Explain McBSP of C54xx with block diagram. 6