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Question Paper Code : 11291

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2012.

Seventh Semester

Computer Science and Engineering

CS 2403/CS 73 — DIGITAL SIGNAL PROCESSING

(Common to Fifth Semester Information Technology)

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State low pass sampling theorem.
2. What is meant by energy and power signals?
3. What is twiddle factor?
4. List the uses of FFT in linear filtering?
5. Compare bilinear and impulse invariant transformation.
6. What is aliasing?
7. What is Gibb's phenomenon?
8. What are limit cycles?
9. What is the need for multirate signal processing?

14. (a) Design a FIR bandstop filter to reject frequencies in the range 1.2 to 1.8 rad/sec using Hamming window, with length $N=6$. Also, realize the linear phase structure of the bandstop FIR filter. (16)

Or

- (b) Explain the characteristics of a limit cycle oscillation with respect to the system described by the equation

$$y(n) = 0.85y(n-2) + 0.72y(n-1) + x(n)$$

Determine the dead band of the filter $x(n) = \left(\frac{3}{4}\right)\delta(n)$. (16)

15. (a) Implement a two-stage decimator for the sampling rate of the input signal equal to 20 KHz, decimation factor $M = 100$, passband equal to 0 to 40 Hz, transition band equal to 40 to 50 Hz, passband ripple equal to 0.01 and stopband ripple equal to 0.002. (16)

Or

- (b) Explain :
- (i) Adaptive noise cancellation with a neat block diagram. (8)
 - (ii) Image enhancement techniques. (8)
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