

Seat No.	31159
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T.E. (Electronics and Telecommunication)**Examination, May - 2015****DIGITAL SIGNAL PROCESSING****Sub. Code : 45692****Day and Date : Wednesday, 06 - 05 - 2015****Total Marks : 100****Time : 2.30 p.m. to 5.30 p.m.**

- Instructions :**
- 1) All Questions are compulsory.
 - 2) Figures to right indicates full marks.
 - 3) Assume suitable data if Required.

SECTION - I**Q1) Attempt any Two: [18]**

- a) State DFT and IDFT. Describe any four important properties of DFT.
- b) Find DFT of the sequence $x(n) = [1, 0, 0, 1]$ for $N = 8$.
- c) Explain the cyclic property of Twiddle Factor. Find the circular convolution of the sequence $x(n) = [1, 3, 5, 3]$, $h(n) = [2, 3, 1, 1]$

Q2) Attempt any Two: [16]

- a) Compare DIF FFT and DIT FFT algorithm.
- b) Derive DIF FFT Flow graph for $N = 8$ Hence Find DFT of the sequence $x(n) = [1, 2, 3, 4]$ using DIF FFT algorithm.
- c) Write a note on overlap save Method.

Q3) Attempt any Two: [16]

- a) Explain Bilinear transformation Method of IIR filter Design.
- b) With flowchart explain in detail LMS algorithm.
- c) Differentiate BLT Method and Impulse Invariance Method.

P.T.O.

SECTION - II

Q4) Attempt any Two:

[18]

- For the analog transfer Function $H(s) = 1/(s + 1)(s + 2)$ Determine $H(z)$ Using impulse invariant technique. Assume $T = 1$ Sec.
- What are the desirable characteristics of Window? Explain in detail step by step method of design of FIR filter using Windows.
- Explain the Fourier series Method of FIR filter Design.

Q5) Attempt any Two:

[16]

- Explain with applications Discrete Cosine Transform. What are the properties of DCT?
- Explain the continuous Wavelet Transform with the required illustration.
- Find the DCT of the sequence $f(x) = [1, 3, 2, 6]$.

Q6) Attempt any Two:

[16]

- Elaborate need for adaptivity. Give some applications where adaptive filtering is done.
- Explain LMS Algorithm for Direct FIR adaptive filter.
- Explain Application of DSP in RADAR.