

Seat No.	31159
----------	-------

**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.