Total No. of Questions :6]

SEAT No. : ____

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Oct./ TE/ Insem. -147

T.E. (E&TC)

DIGITAL SIGNAL PROCESSING

(2015 Course) (Semester - I)

Time : 1 Hour] ***[Max. Marks :30***

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Show the mapping between analog frequencies and digital frequencies. **[4]**

b) What is fold over error? And how to eliminate it? **[4]**

c) Application of DSP in day to day life. **[2]**

OR

Q2) a) Explain the concept of Eigen values and Eigen vector, Find the Eigen values of given matrix A as given below: **[6]**

$$A = \begin{bmatrix} 1 & 1 & 2 \\ 0 & 1 & 3 \\ 0 & 0 & 2 \end{bmatrix}$$

b) Explain the concept of basis function **[4]**

Q3) a) Explain the cyclic property of twiddle factor for 8 point DFT. **[3]**

b) Find linear convolution using overlap save method of the following sequences: **[7]**

$x(n)$ = {1,2,-1,2,3,-2,-3,-1,1,1,2,-1} and $h(n)$ ={1,2,3}

OR

P.T.O.

Q4) a) Draw signal flow graph of radix-2 DIF FFT algorithm for N=4. **[6]**

b) Write short note on DCT. **[4]**

Q5) a) Show relation between Fourier Transform and Z-Transform. **[4]**

b) State and prove the convolution property of Z transform. **[6]**

OR

Q6) a) Impulse response for discrete time system is given as $h(n)$={1,2,3} and output is given as $y(n)$={1,1,2,-1,3}, Determine discrete time input sequence $x(n)$ using long division method. **[6]**

b) Explain how ROC is important to determine the Causality and stability of LTI discrete time system. **[4]**