INTERNAL ASSESSMENT TEST – II

Sub	DIGITAL SIGNAL PROCESSING						Code	18EC52
Date	29 / 10 / 2020	Duration	90 mins	Max Marks	50	Sem V	Branch	ECE/TCE

Answer all the questions

		Marks	CO	RBT
1	Find the circular convolution of $x[n] = [3, -4, 2, -1]$ and $h[n] = [3, -1, 2, -2]$ using Stockham's method (DFT-IDFT method). Verify your answer by computing the circular convolution using matrix method.	[10]	CO1	L2
2	Compute the output $y[n]$ of an LTI system whose impulse response is $h[n] = [1,2,3]$ for the input $x[n] = [1,2,-1,0,1,3,-2,1,4,-2,2]$ using overlap-save method. Use 6 point circular convolution.	[10]	CO1	L2
3	Compute the output $y[n]$ of an LTI system whose impulse response is $h[n] = [1,2,3,1]$ for the input $x[n] = [3,2,-1,2,3,-2,1,1,2,-1,0,1]$ using overlap-add method. Use 7 point circular convolution.	[10]	CO1	L2
4	Compute the 8-point DFT of $x[n] = \sin\left(\frac{\pi}{4}n\right), 0 \le n \le 7$ using DIT-FFT.	[10]	CO3	L2
5	Compute the DFT of $x[n] = [2,1,4,3,4,3,2,1]$ using DIF-FFT.	[10]	CO3	L2

Internal Assessment Test II – October 2020

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Note: Answer All Questions

Question #		Description	Marks Distribution	Max Marks
1		Consider the sequence x[n]=[2,4,6,8,8,6,4,2] with 8-point DFT X[k]. 1) What is the value of X[0] ? 2) What is the value of X[4] ? 3) What is the value of X[1] ? 4) What is the value of X[2] ? 5) What is the value of X[7] ?	10	10
		40 0 -11.6569 - j 4.8284 0 -11.6569 + j 4.8284		
2		Consider the 6-point DFT X[k]=[12, -3 - j 1.7321, 0, 0, 0, -3 + j 1.7321] . Let x[n] be the corresponding time domain sequence. 6) What is the value of x[0] ? 7) What is the value of x[3] ? 8) What is the value of x[1] ? 9) What is the value of x[2] ? 10) What is the value of x[4] ?	10	10
		1 3 2 3 2		
3		Consider the sequence x[n]=[1,2,3,4,4,3,2,1] with 8-point DFT X[k]. 11) What is the value of $\sum_{k=0}^{7} X(k)$ 12) What is the value of $\sum_{k=0}^{7} |X(k)|^2$	10	10
		8 480		

4		Compute the 8-point DFT of $x[n] = sin\left(\frac{\pi n}{4}\right), 0 \leq n \leq 7$ using DIT-FFT.		10	10
		• Output of first stage • Output of second stage • Output of third stage $X[k] = [0 - 4j\ 0\ 0\ 0\ 0\ 0\ 4j]$			
5		Compute the DFT of x[n]=[2,1,4,3,4,3,2,1] using DIF-FFT.		10	10
		• Output of first stage • Output of second stage • Output of third stage $X[k] = [20 - 4.8284 - 2j\ 0\ 0.8284 + 2j\ 4\ 0.8284 - 2j\ 0 - 4.8284 + 2j]$			