



B. P. Poddar Institute of Management & Technology
Department of Electronics & Communication Engineering
Academic Year: 2017-18, Semester: Even



Laboratory Name: Hamming Laboratory Room No.: B603
3 ECE 2nd Semester
Course Name: Digital Signal Processing Laboratory (EC692)

List of Experiments to be conducted

S.No.	Name of Experiment	CO	PO	PSO
Simulation Laboratory using Matlab				
1	Generation of standard discrete sequences, viz. Unit impulse, unit step signal, unit ramp, exponential, sinusoidal and verify different arithmetic operations like amplitude scaling, time scaling, folding, time shifting, addition and multiplication	1	1, 2, 5, 8, 9, 10, 12	1, 2
2	Linear convolution of two sequences using graphical methods and using commands and verification of the properties of convolution	2	1, 2, 5, 8, 9, 10, 12	1, 2
3	Z-transform of various sequences and verification of the properties of Z-transform	3	1, 2, 5, 8, 9, 10, 12	1, 2
4	Verification of the cyclic property of Twiddle Factors	3	1, 2, 5, 8, 9, 10, 12	1, 2
5	Computation of DFTs and IDFTs using matrix multiplication and also using commands	3	1, 2, 5, 8, 9, 10, 12	1, 2
6	Circular convolution of two sequences using graphical methods and using commands, comparison between linear and circular convolutions	2	1, 2, 5, 8, 9, 10, 12	1, 2
7	Verifications of the different algorithms associated with filtering of long data sequences and Overlap-add and Overlap-save methods	2	1, 2, 5, 8, 9, 10, 12	1, 2
8	Design a Butterworth digital IIR lowpass filter using impulse invariant transformation by taking $T=1$ second, to satisfy the given specifications	4	1, 2, 4, 5, 8, 9, 10, 12	1, 2

9	<p>(a) Design a linear phase FIR lowpass filter using rectangular window by taking 7 samples of window sequence and with a cutoff frequency, $\omega_c = 0.2\pi$ rad/sample.</p> <p>(b) Design a linear phase FIR highpass filter using Hamming window, with a cutoff frequency, $\omega_c = 0.8\pi$ rad/sample and $N=7$.</p> <p>(c) Design a linear phase FIR bandpass filter to pass frequencies in the range 0.4π to 0.65π rad/sample by taking 7 samples of Blackman window sequence.</p>	4	1, 2, 4, 5, 8, 9, 10, 12	1, 2
Hardware Laboratory using 5416 Processor and Xilinx FPGA				
10	Writing & execution of programs related to arithmetic operations using Assembly Language of TDM 3020C5416 Processor, study of MAC instruction	5	1, 2, 4, 5, 8, 9, 10, 12	1, 2
11	Writing & execution of programs for operation of convolution using Assembly Language of TDM 3020C5416 Processor, study of MAC instruction	5	1, 2, 4, 5, 8, 9, 10, 12	1, 2
12	Writing of small programs in VHDL and downloading onto Xilinx FPGA	5	1, 2, 4, 5, 8, 9, 10, 12	1, 2
Additional experiment (Only one has to be performed)				
13	Noise removal using Moving-Average Filter	4	1, 2, 4, 5, 8, 9, 10, 12	1, 2
14	Stability testing of the transfer function of an IIR filter	4	1, 2, 4, 5, 8, 9, 10, 12	1, 2