Roll No.												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST - 1

Even Semester: 2018-19

Course Code: ECE 213

Course Name: Digital Signal Processing

Programme & Sem: B.Tech (ECE /EEE) & IV, VI Sem

Date: 05 March 2019

Time: 1 Hour

Max Marks: 40

Weightage: 20%

Instructions:

(i) Read the question properly and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **four** marks (3Qx4M=12)

1. State Sampling Theorem. Sample the given signal x(t)= sin (πt) at Nyquist rate and determine the DT signal x[n].
2. Find the DFT of a sequence x[n] = {1, 2, 3, 4} using matrix method.
3. Find the IDFT of a sequence X(k) ={6, -2+2j, -2,-2-2j} using formula method.

Part B

Answer **all** the Questions. **Each** question carries **eight** marks. (2Qx8M=16)

4. State and prove Parseval's theorem.
5. Given the sequences x[n] = {1, 2, 3, 1} and h[n] = {1, 1, 1}. Obtain the result of linear convolution y[n] using Circular convolution. List any two applications of DFT.

Part C

Answer the Question. Question carries **twelve** marks. (1Qx12M=12)

6. Determine the output y[n] of a filter whose impulse response is h[n] ={1,2} and input sequence is x[n] ={1,2,-1,2,3,-2,-3,-1,1,1,2,-1} using Overlap-add method (consider the length of each block as 4).

Roll No.												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST - 2

Even Semester: 2018-19 | **Date**: 15 April 2019

Course Code: ECE 213 | **Time**: 1 Hour

Course Name: Digital Signal Processing | **Max Marks**: 40

Program & Sem: B,Tech & IV, VI Sem | **Weightage**: 20%

Instructions:

(i) ***Scientific calculators are allowed***

Part A

Answer **both** the Questions. Each question carries **six** marks. (2Qx6M=12)

1. List the advantages of Fast Fourier transform algorithm calculation of DFT over Conventional method of DFT evaluation for N=16.
2. Find the DFT of a sequence **x (n) = {1,2,3,4}** using DIF FFT algorithm

Part B

Answer the Question. The Question carries **twelve** marks. (1Qx12M=12)

3. Find the DFT of a sequence **x (n) = {1, 2, 3, 4, 4, 3, 2, 1}** using radix-2 DIT FFT algorithm.

Part C

Answer the Question. The Question carries **sixteen** marks. (1Qx16M=16)

4. Draw the generalized LPF magnitude response. Mark all the specifications then design an analog Butterworth filter that has 2dB pass band attenuation at a frequency of 20 rad/sec and at least 10dB stop band attenuation at 30rad/sec.

n (order)	Normalized Denominator Polynomials in Factored Form
1	$(1+s)$
2	$(1+1.414s+s^2)$
3	$(1+s)(1+s+s^2)$
4	$(1+0.765s+s^2)(1+1.848s+s^2)$
5	$(1+s)(1+0.618s+s^2)(1+1.618s+s^2)$
6	$(1+0.518s+s^2)(1+1.414s+s^2)(1+1.932s+s^2)$
7	$(1+s)(1+0.445s+s^2)(1+1.247s+s^2)(1+1.802s+s^2)$
8	$(1+0.390s+s^2)(1+1.111s+s^2)(1+1.663s+s^2)(1+1.962s+s^2)$
9	$(1+s)(1+0.347s+s^2)(1+s+s^2)(1+1.532s+s^2)(1+1.879s+s^2)$
10	$(1+0.313s+s^2)(1+0.908s+s^2)(1+1.414s+s^2)(1+1.782s+s^2)(1+1.975s+s^2)$