



ROLL NO: _____

PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Weightage: 20%

Max Marks: 40

Max Time: 1 hr.

Tuesday, 25th September, 2018

TEST – 1

Odd Semester 2018-19

Course: **ECE 202 Signals and Systems**

III Sem. ECE/EEE

Instruction:

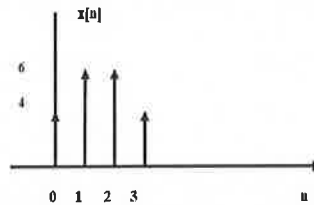
- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

Part A

(2 Q x 6 M = 12 Marks)

1. A discrete-time signal $x[n]$ is shown below. Sketch and label each of the following signal.

(a) $x[-n+2]$ (b) $x[-n]$



2. Determine whether the signal $x(t) = -4t$ is an even signal or odd signal (Give graphical justification for your answer).

Part B

(2 Q x 8 M = 16 Marks)

3. Check whether the following signal $x(t)$ is a periodic signal or non-periodic signal? Find its Fundamental Period T_0 and frequency ω_0 .

$$x(t) = e^{j(5t+\pi)}$$

4. Check whether the following systems is (a) Static or Dynamic, (b) Linear or Non-linear, and (c) Causal or Non-Causal, by giving proper justification. The system is characterized by the equation $y(t) = \cos[x(t - 1)]$.

Part C

(1 Q x 12 M = 12 Marks)

5. Define mathematically and Sketch the following standard signals

- a) Discrete Time Unit Step signal
- b) Continuous Time Ramp signal
- c) Discrete Time sinusoidal signal
- d) Continuous Time Unit Impulse signal
- e) Continuous Time Real Exponential signal





**PRESIDENCY UNIVERSITY,
BENGALURU**

ROLL NO: _____

SCHOOL OF ENGINEERING

TEST 2

Odd Semester: 2018-19

Course Code: ECE 202

Course Name: Signals and Systems

Branch & Sem: ECE, EEE & III Sem

Date: 28 November 2018

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

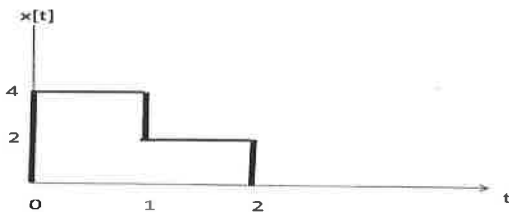
Answer **all** the Questions. **Each** question carries **five** marks. (2x5=10)

- 1. Derive the expression for finding the response of a discrete time Linear Time Invariant (LTI) system with neat block diagram.
- 2. State the Dirichlet's condition for the convergence of Fourier Series. State which method will be used to analyze a signal if that signal does not satisfy Dirichlet's condition.
- 3.

Part B

Answer **all** the Questions. **Each** question carries **Nine** marks. (2x9=18)

- 3. For a continuous time signal, $x(t) = \cos 2t + 3\cos 4t$, find the fundamental frequency ω_0 and determine the Exponential Fourier coefficients.
- 4. Find the Fourier Transform of the signal shown below.



Part C

Answer the Question. Question carries **twelve** marks. (1x12=12)

- 5. For a Discrete Time Linear Time Invariant (DT LTI) system the input $x[n]$ and the impulse response $h[n]$ are defined as $x[n] = 3\delta[n] + 4\delta[n-1] + 5\delta[n-2]$ and $h[n] = u[n] - u[n-3]$
Do the following:
 - (a) plot $x[n]$ and $h[n]$
 - (b) Using Equation Expansion method, find the response $y[n]$ of the DT LTI system and plot $y[n]$.

Roll No.

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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

END TERM FINAL EXAMINATION

Odd Semester: 2018-19

Course Code: ECE 202

Course Name: Signals and Systems

Programme & Sem: ECE, EEE & III Sem

Date: 29 December 2018

Time: 2 Hours

Max Marks: 80

Weightage: 40%

Instructions:

- (i) Read the question properly and answer accordingly.
- (ii) Scientific and Non-programmable calculators are permitted.

Part A

Answer the Question. Question carries **twenty** marks. (1Qx20M=20)1. State and Prove (6+7+7=20)

- a. Complex Conjugate Property of Z-Transform.
- b. Time Shifting Property of Laplace Transform.
- c. Convolution in Time Domain Property of Fourier Transform.

Part B

Answer **both** the Questions. **Each** question carries **twenty** marks. (2Qx20M=40)2. Find the Laplace Transform of the following signals: (10+10=20)

- a) $x(t) = 5\delta(t) - 2\cos 5t$,
- b) $x(t) = 2e^{-2t}u(t) - 3e^{-3t}u(t)$

3. a) Find both the DTFT and Z-Transform of the following signal $x[n]$: (7+7+6=20)

$$x[n] = \{7, 3, 4, -5, 1, -6, 0, 2\}$$



b) State and prove Parseval's Energy theorem (Parseval's Identity) in Fourier transform.

Part C

Answer the Question. Question carries **twenty** marks. (1Qx20M=20)4. Using Z-Transform properties, do the following: (15+5=20)(a) Prove that the z-transform of $x[n] = 7\left(\frac{1}{3}\right)^n u[n] - 6\left(\frac{1}{2}\right)^n u[n]$ is given by

$$X(z) = \frac{z\left(z-\frac{3}{2}\right)}{\left(z-\frac{1}{3}\right)\left(z-\frac{1}{2}\right)}$$

(b) Find the z-transform of $x[n] = \delta[n + 5]$.

