Code No: R1631023   **R16**   SET - 1

III B. Tech I Semester Supplementary Examinations, May - 2019
SIGNALS AND SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

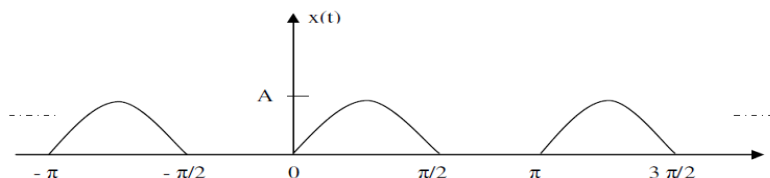Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
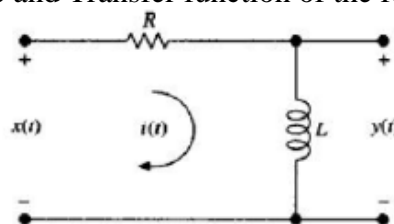~~~~~~

PART –A

1.	a)	State the condition for BIBO stability of the system.	[2M]
	b)	Write the trigonometric Fourier series representation of periodic signal with fundamental period T_0.	[2M]
	c)	What is aliasing effect?	[2M]
	d)	Write the output response of x(t)* δ(t-t$_0$), where x(t) is a continuous signal.	[3M]
	e)	State the relationship between Laplace transform and Fourier transform.	[3M]
	f)	Find the Z transform for casual signal x(n).	[2M]

PART -B

2.	a)	A rectangular function f(t) is defined by $f(t) = 1$; $0 < t < \pi$ and $f(t) = -1$; $\pi < t < 2\pi$ Approximate this function by a waveform sint over the interval $[0, 2\pi]$. Find the optimum value such that mean square error is minimum.	[7M]
	b)	Define and sketch the following signals: i) Signum Function ii) Impulse function iii) Unit step function	[7M]

3. a) Find the Fourier series expansion of halfwave rectified sine wave shown below.   [7M]

b) State and prove Parseval's theorem.   [7M]

4. a) Explain the following terms: [7M]
i) Natural sampling   ii) Importance of sampling theorem.

b) Determine the Nyquist rate for the given continuous time signal: [7M]
x(t) = 6 cos50πt+20 sin 300πt+10 cos 100πt.

5. a) State and Prove Properties of auto correlation function.   [7M]
b) Find the impulse response and Transfer function of the following circuit: [7M]

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6. a) If F(s) = (s+2)/(s+3)(s+4), find all possible f(t).   [7M]

    b) Define Laplace transform. Distinguish between Laplace transform and   [7M]
        continuous time Fourier transforms.

7. a) Determine the final value of the signal corresponding to the following   [7M]
        Z-transform:

$$X(Z) = \frac{2Z^{-1}}{1 - 1.8Z^{-1} + 0.8Z^{-2}}$$

    b) State and prove any four z-transform properties.   [7M]

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