Regulation 18 *Subject code:2P3DD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech III Semester Supplementary Examinations, March/April 2023

SIGNALS& SYSTEMS

(Electronics and Communication Engineering)

Maximum Marks: 70 Date:04.04.2023 **Duration: 3 Hours**

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 10 questions. Answer any 5 questions which carries 10M.
4. Each question carries 10marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 Write the expressions for total energy E and average power P of a signal.
2 Write the significance of wave symmetry.
3 State the conditions for the existence of Fourier transform.
4 What do you mean by aliasing effect?
5 Define the linear time-invariant system.
6 State Ideal LPF characteristics.
7 Define Energy Spectral Density
8 State the time shifting property of the Laplace transform.
9 State Parseval's power theorem.
10 Determine Z transform of x(n)={1 ,2, 4,2}

Part-B

Answer all the questions (5X10M=50Marks)

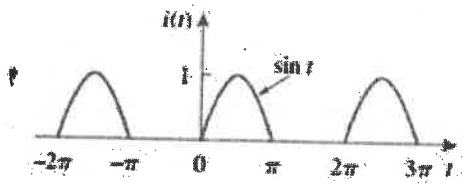
11 Define the Analog and Digital signal and write any four properties of signals. [10]

OR

12 Find the Fourier Transform of the signals [5+5]

a) Signum function b) $e^{-a|t|}$

13 Find the Trigonometric Fourier series of the half wave rectified sine wave as shown below. [10]



OR

14 With the help of graphical example analyze sampling theorem for low pass signals.[10]

15 Check whether the following system $y(t)=t^{2t}x(t)+x(t+4)$ is [10]
(a)static or dynamic (b) linear or non-linear
(c) causal or non-causal (d) time variant or invariant

OR

16 State & prove the conditions for distortion less transmission. [10]

17 a) Determine the convolution of two functions $x(t)=e^{-2t}u(t)$; $y(t)= e^{-4t}u(t)$. [6]
b) Obtain relation between convolution and correlation. [4]

OR

18 a) State & prove any two properties of Auto-correlation function. [5]

b) Explain the detection of periodic signal in the presence of noise by Autocorrelation. [5]

19 a) Find the Laplace transform unit impulse and unit step functions. [4]
b) Find the Laplace transform of the $x(t)=e^{-2t}u(t)+e^{3t}u(t)$. [6]

OR

20 Develop the inverse Z-transform of $X(z)=\frac{z}{z(z-1)(z-2)^2}$ using long division method. [10]