



Regulation 18

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, January 2023

SIGNALS & SYSTEMS

(EEE)

Maximum Marks: 70

19-01-2023

Duration: 3 Hours

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 List out conditions to be power signal, with an example.
- 2 Define the trigonometric Fourier series.
- 3 Write the properties of state transition matrix.
- 4 What is aliasing effect?
- 5 Define the linear time-invariant system.
- 6 State Parseval's power theorem
- 7 Define Energy Spectral Density
- 8 State the time shifting property of the Laplace transform.
- 9 State final value theorem of the Laplace transform.
- 10 Determine Z transform of $x(n)=\{1, 0, 4, 2\}$

Part-B

Answer all the questions

(10MX 5=50Marks)

- 11 a) Define any four properties of signals. [5+5]M
b) Compare Continuous signals and discrete signals.

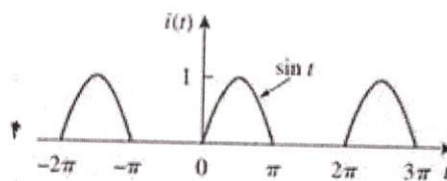
OR

- 12 Find the Fourier Transform of the signals

[5+5]M

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

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



OR

- 14 With the help of graphical example analyze sampling theorem for low pass signals. [10] M
- 15 Check whether the following system $y(t)=t^2x(t)+x(t-4)$ is [10]M
(a) static or dynamic (b) linear or non-linear
(c) causal or non-causal (d) time variant or invariant

OR

- 16 (a) Define Nyquist sampling rate and Nyquist sampling interval. What are effects of under sampling?
(b) State and prove the sampling theorem. [6+4]M
- 17 a) Write short notes on Power Spectral Density. [4+6]M
b) State & prove any three properties of Laplace transform .

OR

- 18 a) State & prove Frequency Convolution theorem. [5+5]M
b) State and prove any two Fourier transform properties.
- 19 Analyze LTI system is described by $\frac{d^2 y(t)}{dt^2} + 5 \frac{dy(t)}{dt} + 6y(t) = x(t)$ find the impulse response of the system. [10]M
- OR
- 20 Solve the z-transform and ROC of the following sequences [10]M
a) $x[n] = [4(5^n) - 3(4^n)] u(n)$ b) $(1/3)^n [u(-n) - u(n-8)]$