Total number of printed pages: **01** **UG/5th Sem/UIE511**

BACK 2024

Digital Signal Processing

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

Q1.	a)	Draw the Block diagram of Digital Processing of an Analog signal.	05
	b)	Draw the complete signal flow graph of 4 points DIF FFT algorithm.	05
	c)	Draw the block diagram of circular convolution using DFT.	05
	d)	Write the names of five basic time domain operation on sequence.	05
Q2.	a)	Compute the DFT of sequence x(n)=[15+3i, 4, 15-3i, -4]	05
	b)	Determine the power and RMS value of the following signals. $y(t) = 5\cos(50t + \pi/6)$	05
	c)	Determine the causal signal x(n) having the z-transform $X(z) = \frac{1}{(1+2z^{-1})(1-3z^{-1})}$	05
	d)	Defined the Total Energy, Average Power and Energy sequence.	05
Q3.	a)	A discrete time causal system has a transfer function $H(z) = \frac{(1-z^{-1})}{(1-2z^{-1}+3z^{-2})}$ Determine the difference equation of the system	05
	b)	Why are FFT techniques so important in digital signal processing?	05
	c)	A discrete-time signal $x[n] = \{2, 0, (5), -1, 3, 6\}$. Sketch and label $2 * x(n-3)$	05
	d)	Compute the convolution of these pairs of signals $x[n] = \{3,1,2\}, \quad h[n] = u[n]$	05
Q4.	a)	Find out the circular convolution $y_C[n] = x[n](4)h[n]$, Where x[n]={2, 0, 5, 3}, h[n]={3, 0, 0, 5}.	05
	b)	What are the conditions for a system to be LTI systems.	05
	c)	What are the advantage of DSP?	05
	d)	Write the 4th order difference equation.	05
Q5.	a)	Find out $u(n\text{-}2) - u(n-3)$	05
	b)	Check whether the following system is static or dynamic and also causal or non-causal system: y (n) = 5*x(2n)	05
	c)	Write down the Classification of Systems.	05
	d)	Check for periodicity of $cos(0.05\pi n)$.	05
Q6.	a)	When a system is said to be memory less? Give Example.	05
	b)	State the significance of impulse response.	05
	c)	Define symmetric and anti-symmetric signals.	05
	d)	What is aliasing?	05

**********End of UIE511**********