M.Sc. (Electronics) (New CBCS Pattern) Sem-III

PSELT303.1 - Paper-III - DSE-I : Digital Signal Processing

P. Pages : 2 **GUG/W/22/11255**

Time : Three Hours * 3 7 9 6 * Max. Marks : 80

Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and labelled diagram wherever necessary.
3. Use of calculator/log table is allowed.

Either:

1. a) Explain how discrete time signal differs from continuous time signal. **8**

b) Describe the power signal and energy signal. **8**

OR

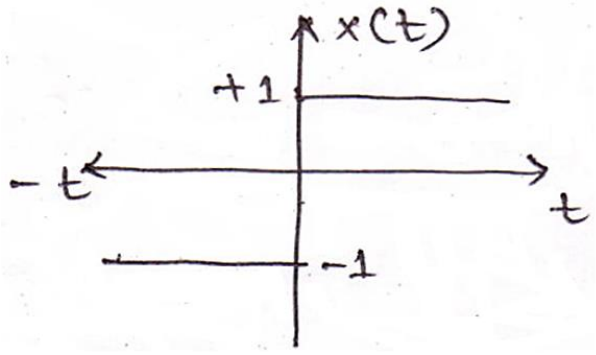
c) Perform convolution sum using mathematical equation of convolution Given **8**
$h[n] = \left\{1, \underset{\uparrow}{2}, 1, -1\right\}$, $x[n] = \left\{\underset{\uparrow}{1}, 2, 3, 1\right\}$.

d) Describe a first order difference equation for recursive system. **8**

Either:

2. a) Explain the following property of Fourier transform **8**
i) Linearity ii) Time scaling

b) Find the Fourier transform of signum function shown as follows. **8**



OR

c) What is twiddle factor? Explain it with suitable example. **8**

d) Derive the equation of the z-transform. **8**

Either:

3.	a)	Explain the direct form and cascade form structure of FIR filter.	**8**
	b)	Differentiate between FIR system and IIR system.	**8**

OR

	c)	Explain the matched z-transformation method to design IIR filter with suitable example.	**8**
	d)	Describe the windowing technique method to design FIR filter.	**8**

Either:

4.	a)	Draw block diagram of Motorola DSP 56000 family. Explain ALU and memory.	**8**
	b)	Describe the Von Neumann architecture of processor.	**8**

OR

	c)	State the feature of TMS320C54X and explain the function of ALU and Accumulator.	**8**
	d)	Explain the echo effect introduced in music.	**8**
5.	a)	Discuss cross correlation.	**4**
	b)	Explain the time shifting property of Fourier transform.	**4**
	c)	What is digital filter? Explain it with suitable diagram.	**4**
	d)	Discuss Chorus effect in musical sound processing.	**4**

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