



InSem Examination-II Summer 2024		
Exam Seat No.:		
Academic Year: 2023-2024	Semester: IV	
Name of Programme: S. Y. B.Tech (E & TC)	Pattern: 2022	
Name of Course: Digital Signal Processing	Course Code: ETC222011	
Max. Marks: 30	Duration: 1	

	<p>Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.</p> <ol style="list-style-type: none">1. This question paper contains 2 page(s).2. Answer to each new question is to be started on a new page.3. Assume suitable data wherever required, but justify it.4. Draw the neat labelled diagrams, wherever necessary.5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.	
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Question No. 1 Attempt following Question

- a) Find even and odd parts of the following signal. (7) CO1
i) $X(n) = \{-2, 1, 4, 0, -3\}$ ii) $X(t) = u(t)$

OR

- b) Check whether the following signal is an energy or power signal: (7) CO1
i) $x(t) = 5\cos(\pi t)$ for $-\infty < t < \infty$
ii) $x(n) = \cos(\pi n)$ for $-5 \leq n \leq 5$,
= 0 otherwise.

OR

- c) Explain aliasing effect and how it can be overcome. Determine the Nyquist rate for given signal (8) CO1
 $X(t) = 3 \sin(400\pi t) \cos(600\pi t)$
- d) Sketch the following if $X(n) = \{2, -1, 3, 4, -2\}$ (8) CO1
i) $X(n+2)$ ii) $X(n/2)$

Question No. 2 Attempt following Question

- a) Determine whether the following systems are memoryless, causal, stable, linear, time invariant and invertible for $y(t) = x(3t)$. (7) CO2

OR

b) Determine whether the following systems are memoryless, causal, stable, linear, time invariant and invertible for $y(n) = x(n-1)$. (7) CO2

c) Compute convolution integral for $h(t) = u(t)$ and $x(t) = u(t-2)$ using graphical method. (8) CO2

OR

d) State properties of convolution and prove the associative property of convolution. (8) CO2

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