K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:IV
Class:SY	Program:B.Tech
Branch Code:ETC	Pattern:2022
Name of Course:Digital Signal Processing	Course Code:ETC222011
Max. Marks:60	Duration:2.30 Hrs.

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.

1. This question paper contains __two___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.

		Marks	CO
Question No. 1			
1a)	Q1) Find whether the given signal is a even and odd $x(t)=4+2t+t^2$	(6)	CO1
Question No. 2			
2a)	Q2)Check the following system is 1) linear and nonlinear 2) static and dynamic y(n)= cos x(n)	(6)	CO2
Question No. 3			
3a)	Q3a)Obtain 4-point DFT of x(n)={1, 2, 3, 4}	(8)	CO3
	OR		
3b)	Q3b)Perform the circular convolution of x(n) and h(n) using matrix method x(n)={ 1,3,2,6} and h(n)={ 5,2,7,4}	(8)	CO3
3c)	Q3c)Perform the circular convolution of two sequences x1(n)= {8, 6, 2, 3} and x2(n)={1, 3, 4, 5} using Concentric circle method	(8)	CO3
	OR		
3d)	Q3d)Determine the IDFT of X(K)={8, 4, 2, 3}, where N=4	(8)	CO3
Question No. 4			
4a)	Q4a)Compute 4-point DFT of the sequence x(n)= {2, 4, 6, 8} using DIT- FFT algorithm.	(8)	CO4
	OR		
4b)	Q4b)How many computations are required to compute 8 point and 16 point DFT using DFT and FFT algorithms?	(8)	CO4
4c)	Q4c)Compute 4-point DFT of the sequence x(n)= {1,2,6,8} using DIF- FFT algorithm	(8)	CO4

OR

4d)	Q4d)Explain memory requirement and In-place computation used in FFT algorithm.	(8)	CO4

Question No. 5

5a)	Q5a)Explain Bilinear mapping technique in detail.	(8)	CO5

OR

5b)	Q5b)The transfer function of analog system is given of H(s)=1/(S+1) Determine H(z) ,using impulse invariance method. Assume T=1sec.	(8)	CO5
5c)	Q5c)Write down the mathematical expression for the following windows 1) Bartlett 2) hamming 3) hanning 4) triangular	(8)	CO5

OR

5d)	Q5d)Write short note on windowing and compare all type of windows.	(8)	CO5

····· End of question paper·····