



GIET UNIVERSITY, GUNUPUR - 765022
M. Tech (First Semester) Examinations, January - 2024
MPEVL1041- Real Time Signal Processing Systems
(VLSI Design)

Time: 3 hrs

Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A**(2 x 10 = 20 Marks)**

Q1. Answer all the questions	CO#	Blooms Level
a. What are the advantage of FFT over direct computation of DFT?	CO1	K3
b. What is the design of the IIR Filter?	CO2	K1
c. What is decimation in DSP theory?	CO3	K3
d. Why FFT is needed in computation of DFT?	CO4	K1
e. What is the difference between cascade form and parallel form?	CO1	K3
f. What are the features of IIR filter?	CO2	K1
g. Why is frequency domain sampling necessary?	CO3	K3
h. What is the structure of direct form II?	CO4	K1
i. How is FFT useful to represent a signal?	CO1	K3
j. What direct form is FIR filter?	CO2	K1

PART – B**(10 x 5=50 Marks)**Answer **ANY FIVE** questions

	Marks	CO#	Blooms Level
2. a. Write a concise note on both IIR and FIR filters, discussing their design considerations and use cases.	5	CO1	K3
b. Explain the relationship between Discrete Fourier Transform (DFT) and Z-transform, illustrating their connections in signal processing.	5	CO1	K2
3.a. Explore the concept of quantization error in digital signal processing, discussing its causes and implications.	5	CO2	K4
b. Discuss the concept of zero-padding in the context of Fast Fourier Transform (FFT) and its impact on spectral analysis.	5	CO2	K3
4. a. Analyze the advantages and disadvantages of Fast Fourier Transform (FFT) in the context of signal analysis.	5	CO3	K1
b. Provide a brief overview of the architecture of TMS320C6713, detailing its components and functionalities.	5	CO3	K2

5.a.	Explore the differences between cascade and parallel forms in the design of signal processing systems.	5	CO4	K3
b.	Provide a brief explanation of why Fast Fourier Transform (FFT) is termed "fast" and discuss its significance in signal processing.	5	CO4	K1
6. a.	Elaborate on the trade-offs between time-domain and frequency-domain representations in signal analysis, considering their advantages and limitations.	5	CO1	K4
b.	Compare the design principles of Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) filters, highlighting their characteristics and applications.	5	CO1	K2
7.a.	Explain the structural features of direct form II in the implementation of digital filters.	5	CO2	K4
b.	Compare and contrast the differences between Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), emphasizing their applications and efficiency.	5	CO2	K2
8. a.	Elaborate on the distinctions between Discrete Fourier Transform (DFT) and Discrete Inverse Fourier Transform (DIFT), exploring their respective roles in signal processing.	5	CO3	K2
b.	Differentiate between decimation and interpolation in the realm of signal processing, outlining their applications and effects.	5	CO3	K4

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