Seat No.

MAR_APR 2026 SUMMER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Digital Signal Processing

Sub. Code: 81646/81856

Day and Date: Friday ,22-05-2026 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: **1. All questions are compulsory**
2. Figures to the right indicate full marks

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Q1) Solve following MCQ. **[14]**

i. Twiddle factor W_8^2 is equal to _____
- A. 1
- B. -0.707+ j0.707
- C. -j
- D. none of these

ii. Which of the following filter has feedback does not present in realization structure ?
- A. FIR
- B. IIR
- C. both A and B
- D. none of these

iii. In DSP Processor fetching the next instruction while current instruction is being under execution is called_____
- A. parallel processing
- B. filtering
- C. pipelining
- D. none of these

iv. The FFT algorithms are used to reduce complex _____ of the computation of DFT.
- A. multiplication
- B. multiplication and addition
- C. addition
- D. none of these

v. _____ is the process of decreasing the sampling rate by a factor D.
- A. decimation
- B. interpolation
- C. convolution
- D. none of these

vi. The _____ filters are linear phase filters.

A. low pass
B. IIR
C. FIR
D. none of these

vii. A Wavelet Transform of time domain signal x(t) results in _____

A. Time domain signal
B. frequency domain signal
C. time and Frequency domain signal
D. none of these

Q2) Solve any two of the following **[14]**

a. Find the circular convolution of two finite duration sequences x1(n)={1, -1, -2, 3} and x2(n)={1, 2, 3, 4} **[7]**

b. Explain various Window functions used in FIR filter design using Windowing method. **[7]**

c. Explain why frequency transformations are needed for IIR filters. **[7]**

Q3) Solve any two of the following. **[14]**

a. Explain important characteristics of FIR filters. **[7]**

b. Explain with suitable example Overlap-Add mentod of block convolution. **[7]**

c. Discuss IIR filter design using bilinear transformation technique. **[7]**

Q4) Solve any two of the following. **[14]**

a. Obtain Direct Form realization structure for the FIR filter whose impulse response is, h(n) = {1,3,4,-3, 2} **[7]**

b. Explain the method of sampling rate conversion by a rational factor I/D. **[7]**

c. Explain Multi resolution analysis in Wavelet Transform. **[7]**

Q5) Solve any two of the following. **[14]**

a. Differentiate between Interpolation and Decimation process used in multi rate DSP. **[7]**

b. Explain mother wavelet in detail. **[7]**

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c. Draw architecture of TMS320C67XX and explain functional units **[7]**

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
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1] (1154) B.Tech. CBCS (81646) Digital Signal Processing Part 3 SEM 6

2] (101) Bachelor of Engineering (81856) Digital Signal Processing Part 3 SEM 6

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