

UNIT-II

3. Given $x_1[n] = \{1, 1, 2, 2\}$ and $N=8$, Find $X(k)$ using DIF FFT algorithm. 14
4. Perform the circular convolution of the following two sequences graphically.
 $x_1[n] = \{1, 1, 2, 2\}$
 $x_2[n] = \{1, 2, 3, 4\}$
 Cross verify the same using matrix method. 9+5

UNIT-III

5. What are frequency selective filters? Also write the differences between IIR and FIR filters. 8+6
6. Determine the direct form I and II for the second order filter given by 7+7

UNIT-IV

7. Discuss in brief various windowing techniques. 14
8. Write the short note on
 a) Impulse invariance technique
 b) Bilinear Transform 7+7

UNIT-V

9. Explain the fixed and floating point representation of numbers. Also discuss finite word length effects. 8+6
10. Write a short note on
 a) Zero-input limit cycle oscillations
 b) Overflow limit cycle oscillations 7+7

M. Tech Odd Semester Examination, February, 2023**Electronics & Communication Engineering**
(1st Semester)Course No.: MECE-104A
(Digital Signal Processing)

Full Marks: 70

Pass Marks: 28

Time: 3 hours

- Note:**
1. Attempt 05 (Five) questions by taking one from each unit.
 2. Begin each answer in a new page.
 3. Answer parts of a question at a place.
 4. Assume reasonable data wherever required.
 5. The figures in the right margin indicate full marks for the question.

$$y(n) = 2b \cos w_0 y(n-1) - b^2 y(n-2) + bc \cos w_0 x(n-1)$$

1. A. Describe continuous and discrete-time signals? State the different classifications of signals with example in discrete domain. 8
- B. Determine whether the following signals are power, energy, or neither. Find the respective values also.
 a) $x[n] = \sin^2 w_0 t$
 b) $x[n] = \text{rect}(t/\tau)$ 6
2. A. Describe continuous and discrete-time systems? State the different classifications of systems with example in discrete domain. 8
- B. State whether the given system $y(n) = x(n/2)$ is
 a. Linear b. Time Invariant c. Causal 6