Name:.....

Roll No:.....

MAR ATHANASIUS COLLEGE OF ENGINEERING
KOTHAMANGALAM – 686666
(Govt. Aided Autonomous Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B. TECH FIRST SERIES EXAMINATION, AUGUST 2026

S5(ECE A &B) B24EC3T01 DIGITAL SIGNAL PROCESSING

Max Marks: 40 **Duration:1.5 Hours**

PART A
Answer all questions. Each question carries 3 marks.

1. Given x(n) = {1,2,3,1}, h(n) = {1,2,1}, Find the linear response by using Circular convolution. (CO1)

2. Given X(k) = {2, 1-j, 0, 1+j}, Find x(n) using matrix method. (CO1)

3. Construct the butterfly structure of 2 input Radix 2 DIT FFT algorithm and write the output equations? (CO2)

4. What is Twiddle factor? Write any 2 properties of Twiddle factor. (CO2)

PART B
Answer all questions. Each question carries 14 marks.

5. Find the response of the system with h(n) = {1,2,1,1} and x(n) = {4,3,2,1,0,1,2,3,4,3,2,1,0,1,2,1,1} using overlap save method and overlap add method?. Take sequence length = 4. (CO1)

6 a) Find the 8 point DFT of a sequence x(n) ={1,1,1,1,1,1}? (CO1)

b) Draw the butterfly diagram of 8 point DIT FFT algorithm. (CO2)

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Nurture technically competent professionals in Electronics and Communication Engineering equipped with the skills to address global challenges.

Foster socially responsible technocrats and entrepreneurs who contribute positively to society through their expertise and leadership.