

Gate 2023\_ec\_47

Karyampudi Meghana Sai  
EE23BTECH11031

February 11, 2024

## Problem Statement

Consider a discrete-time signal with period  $N = 5$ . Let the discrete-time Fourier series (DTFS) representation be  $x[n] = \sum_{k=0}^4 a_k e^{\frac{jk2\pi n}{5}}$  where  $a_0 = 1$ ,  $a_1 = 3j$ ,  $a_2 = 2j$ ,  $a_3 = -2j$ ,  $a_4 = -3j$ . The value of the sum  $\sum_{n=0}^4 x[n] \sin\left(\frac{4\pi n}{5}\right)$  is