

SNS COLLEGE OF ENGINEERING



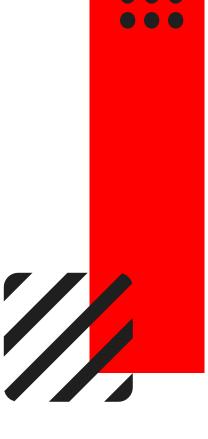
(Autonomous)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

UNIT-I

Discrete Fourier Transform

Introduction to IDFT











Find the IDFT of X(K)= {1,0,1,0}



TDFT: $X(R) = \frac{1}{N} \sum_{k=0}^{N-1} X(k) \cdot e^{\sum_{k=0}^{N-1} KR}, \quad where$ Here, X(k) = 2/0, 1, 03

 $\chi(n) = \frac{1}{4} \frac{3}{5} \chi(k) e^{\frac{1}{2}\frac{\pi kn}{4}}$ $x(x) = \frac{1}{4} \left[x(0) \cdot e^{0} + x(1) e^{\frac{12\pi x^{2}}{4}} + x(3) e^{\frac{12\pi x^{2}}{4}} \right]$ x(n)= 1 [x(0).e° + x(1) e2 + x(2) e + N = 0, 1, 2, 3 $\times (3) = \frac{1}{4}$ $\times (3) = \frac{1}{2}$ $\times (3) = \frac{1}{2}$ $\times (3) = \frac{1}{2}$ $\times (3) = \frac{1}{2}$ $= \frac{1}{4}$ $= \frac{1}{4}$ $= \frac{1}{4}$ $\times (3) = 1, \times (3) = 0, \times (3) = 1, \times (3) = 0.$ = = = [1.1 + 0+ 1. e) m, +0]. x co? = 1 [1+ cos o+jsino] = 1 [1+1] = 1/2 = /2 X(1) = /4 [1+ cos T+ j sin T] x(2) = VA [H 082T - j sin 2T]

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$$\frac{1}{4} (1+1)$$

$$\chi(2) = \frac{1}{2}.$$

$$\chi(3) = \frac{1}{4} [t + \cos 3T - j \sin 3T]$$

$$= \frac{1}{4} [1-1]$$

$$\chi(3) = 0.$$
Answer:
$$\chi(n) = \frac{1}{2} \frac{1}{2}, 0\frac{1}{2}, 0\frac{3}{2}.$$







Thank You!

