

Tutorial No:- 05

question no.1 → In the basic divide-and-conquer approach to compute DFT, let us adopt a column-wise mapping for $x(n)$ (discrete-time sequence) and the row-wise mapping for the DFT ($X[k]$).

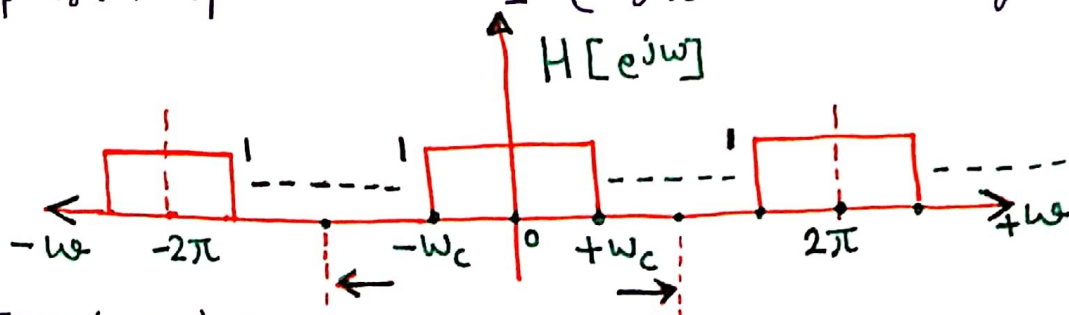
Comment about its computational complexity in terms of the total number of complex multiplications and the total number of complex additions, while computing an N -point DFT.

question no.2 → Based on the basic divide-and-conquer approach, draw the basic butterfly computation in a radix-2 FFT algorithm (decimation-in-time approach).
(decimation-in-frequency approach)

question no.3 → Consider the signal $x(t)$, whose Fourier-transform is $X[j\omega] = \begin{cases} 1 & ; |\omega| < W \\ 0 & ; |\omega| > W \end{cases}$.

Determine $x(t)$, and plot it w.r.t. 't' in cont. time domain.

question no.4 → Consider a discrete-time system with impulse response $H[e^{j\omega}]$ (as shown in Figure given below).



Determine $h(n)$, and plot it w.r.t. 'n' in discrete-time domain.