

# Digital Signal Processing Lab

## Experiment 6: Efficient Computation of DFT and IDFT using FFT

### I Pre Lab Questions

1 Why do we need Fourier transform in DSP?

Soln. Fourier transform helps to convert signal in time domain to frequency domain, it tells which frequencies are present in the signal. It decomposes an image into sine and cosine components.

2 What is the need of FFT?

Soln. Mathematical method to transform  $f(t)$  of time into  $f(\omega)$  of frequency, analysis of time dependent phenomenon.

3 What is the difference between FFT and DFT?

FFT	DFT
a) It is abbreviated as Fast Fourier Transform.	a) DFT is abbreviated as Discrete Fourier Transform.
b) It is faster version than DFT algorithm.	b) It is the discrete version of FFT.
c) Various fast DFT computation techniques are collectively known as FFT.	c) It is the algorithm that transforms the time domain signals to frequency components.

4 What is "decimation-in-time" versus "decimation-in-frequency"?

Soln. Decimation in time:

a) The algorithms are based upon decomposition of the input sequence into smaller and smaller sub-sequences.

b) In DIT input sequence is in bit reversed order while the output sequence is in natural order.

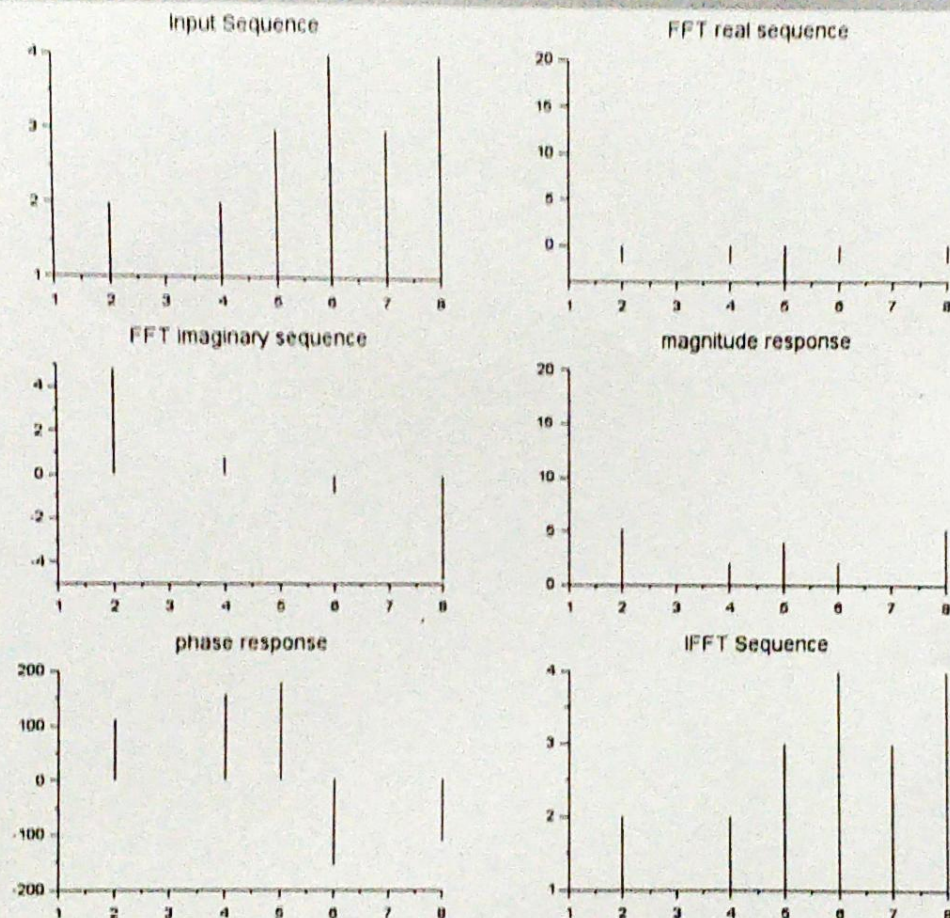
c) Splitting operation is done on time domain sequence.



### Disimination In Frequency:

- a) The algorithms are based upon decomposition of the output sequence into smaller and smaller sub sequences.
- b) In DFT Input sequence is in natural order and DFT should be read in bit reversed order.
- c) Splitting operation is done in frequency domain sequence.





### RESULT.

Effective Computation of DFT and IDFT Using FFT for a given Sequence was Completed using Matlab and its output was verified.

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