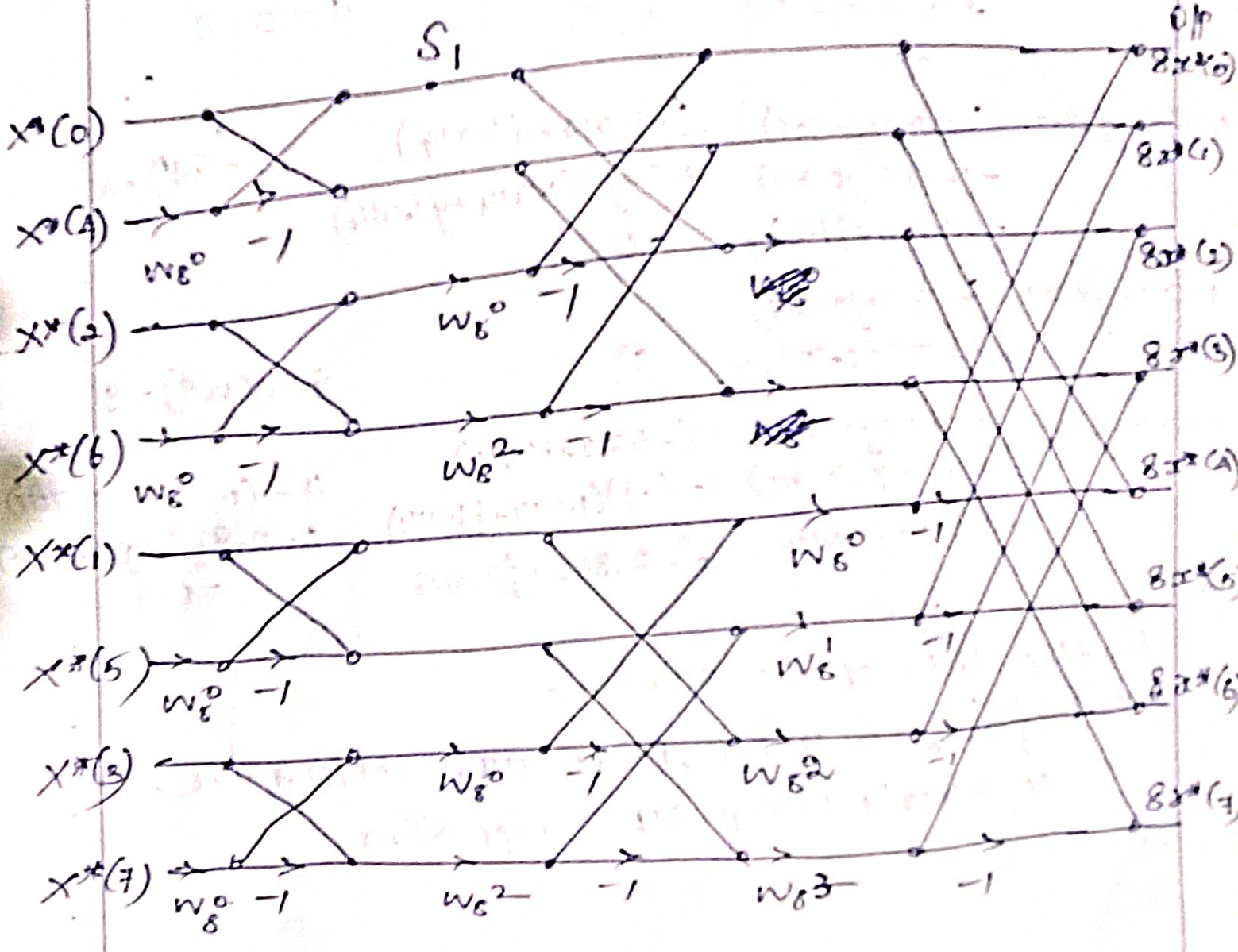
IDFT using FFT Algorithm

$$x(n) = \frac{1}{N}\left[\sum_{k=0}^{N-1} X^*(k)\, W_N^{nk}\right]^*$$

① Compute IDFT of the sequence using DIT-IFFT

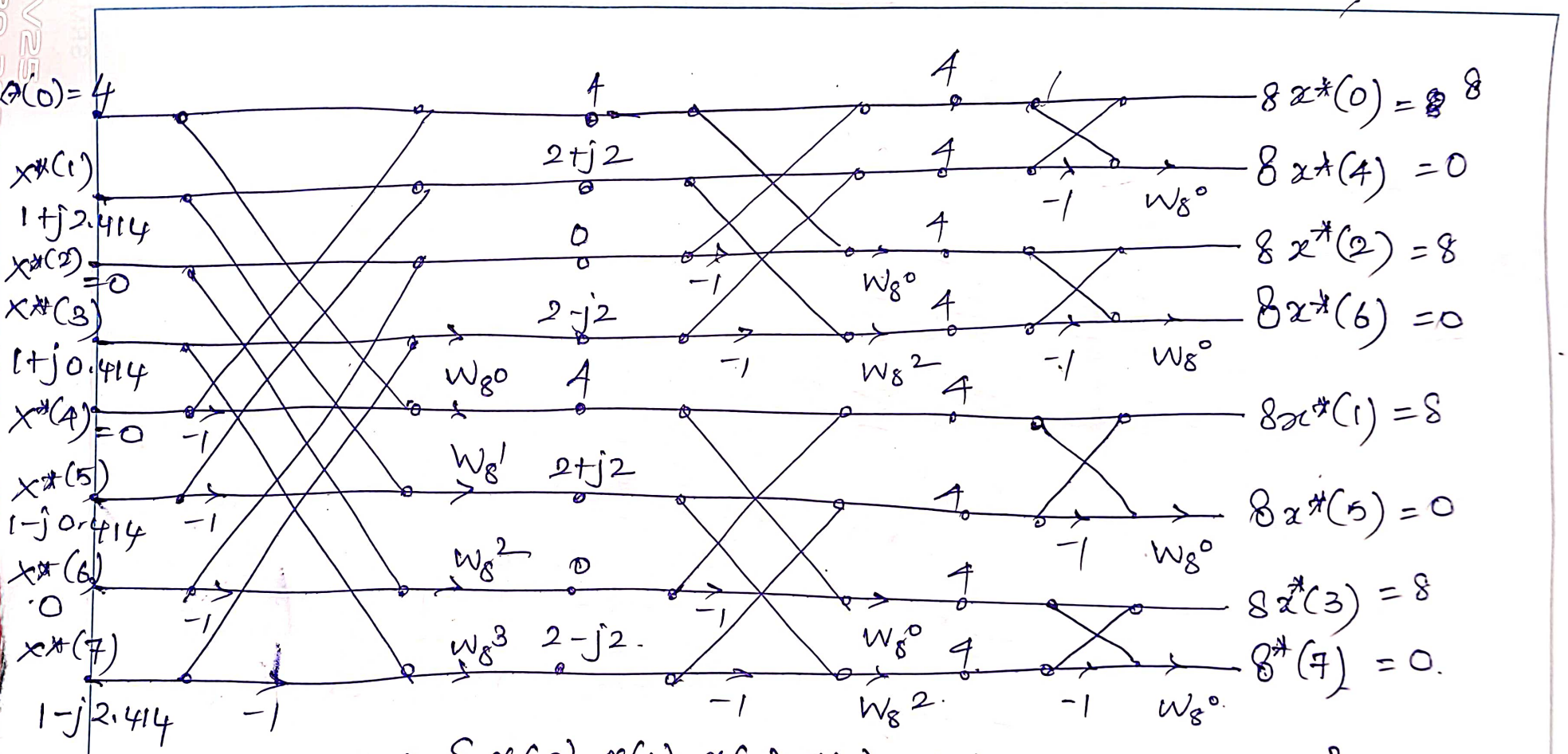
$X(k) = \{1, -0.707 - j0.707, -j, 0.707 - j0.707, 1, 0.707 + j0.707, j, -0.707 + j0.707\}$



I/P	S_1	S_2	O/P
1	$1+1=8$	$8+0=8$	$8+0=8$
1	$1-1=6$	$6+(-j)2j=8$	$8+0(W^1)=8$
j	$j-j=0$	$8-0=8$	$8+0(W^2)=8$
$-j$	$j-(-j)=2j$	$6-(-j)(2j)=4$	$4+(-0.707+j0.707)$ $(-2.828+j2.828)$ $=8$
$-0.707+j0.707$	$(0.707+j0.707)$ $+(0.707-j0.707)$ $=0$	0	$8-0=8$
$0.707-j0.707$	$(-0.707+j0.707)$ $-(0.707-j0.707)$ $=-1.414+j1.414$	$(-1.414+j1.414)$ $+(-j)(1.414+j1.414)$ $=0$	$8-0(W^1)=8$
$0.707+j0.707$	$(0.707+j0.707)$ $+(-0.707-j0.707=0$	0	$8-0(W^2)=8$
$-0.707-j0.707$	$0.707+j0.707$ $-(-0.707-j0.707)$ $=1.414+j1.414$	$(-1.414+j1.414)$ $-(-j)(1.414+j1.414)$ $=-2.828+j2.828$	$4-(0.707-j0.707)$ $(-2.828+j2.828)$ $=0$

Find the IDFT of the sequence

$x(k)=\{4,1-j2.414,0,1-j0.414,0,1+j0.414,0,1+j2.414\}$ using DIF algorithm



$x(n) = \{x(0), x(1), x(2), x(3), x(4), x(5), x(6), x(7)\}$.

$\Rightarrow \{1, 1, 1, 1, 0, 0, 0, 0\}$.