1. Find the DFT of a sequence $x(n) = \{1,1,0,0\}$ and find the IDFT of the sequence $X(k) = \{1,0,1,0\}$.

2. Find the N-point DFT of the following:
   A. $x(n) = \delta(n)$.
   B. $x(n) = \delta(n - n_o)$
   C. $x(n) = (a)^n$

3. Compute the DFT of a sequence $(-1)^n$ for N=4.

4. Determine the 8-point DFT of the sequence $x(n) = \{1,1,1,1,1,1,0,0\}$ using linear transformation method.

5. Find the circular convolution of the two finite duration sequences $x_1(n) = \{1,-1,-2,3,-1\}$ and $x_2(n) = \{1,2,3\}$.

6. Given the sequences $x_1(n) = \{1,2,3,4\}$; $x_2(n) = \{1,1,2,2\}$ find $x_3(n)$ such that $X_3(k) = X_1(k)X_2(k)$.