Signal Processing

Quiz-2, 2024

Answer all the questions, each question carry equal marks.

1. An 8-point DIF FFT chip found to be faulty after the manufacturing, where the input locations 1,3,5 and 7 are permanently grounded i.e the input value is zero always.
   a. Can an 8-point DFT obtained for an arbitrary $x[n]$ of length 8 using the two such faulty chips? Justify your decision? If needed show the connections.

2. Prove the following identity: $\sum_{n=-\infty}^{\infty} e^{-jn\Omega T_s} = \frac{2\pi}{T_s} \sum_{k=-\infty}^{\infty} \delta(\Omega - \Omega_s k)$, where Ω is continuous time angular frequency and $\Omega_s = \frac{2\pi}{T_s}$

3. Let the pole-zero plot of a systems is shown below then compute and precisely plot the phase spectrum of the system. Explain necessary calculations and assumptions.