Test 1 - No.1

DSP

Exercises

1. (2p) Consider the analog signal $x_a(t) = 2 + \cos(600\pi t)$. What is the minimum sampling frequency required to avoid aliasing?
2. (2p) The analog signal $x_a(t) = 2 + cos(600\pi t)$ is sampled with sampling frequency $F_s = 500$Hz. Write the expression of the discrete signal obtained.
3. Consider the discrete signal $x[n] = 0.5 \cdot cos(\frac{3}{8}\pi n)$.
   a. (1.5p) Show that the signal is periodic
   b. (1.5p) Find its fundamental period N
4. (2p) What is the Z transform of the signal $x[n] = \{..., 0, 0, 1, \underset{\uparrow}{2}, 3, 4, 0, ...\}$?