Serie Nº. 4

Problem 1

Calculate and represent the spectral energy density of the signal :

$$x(n) = a^n u(n)\ ,\ \ -1 < a < 1$$

Problem 2

We consider the following signal:

$$\boldsymbol{x(n) = 2 + 2cos\left(\frac{n\pi}{4}\right) + cos\left(\frac{n\pi}{4}\right) + \frac{1}{2}cos(\frac{3n\pi}{4})}$$

a- Determine and represent its power spectral density?

b- Calculate the signal power?

Problem 3

Calculate the Fourier transforms of the following discrete signals:

a- $x(n) = u(n) - u(n-6)$

b- $x(n) = 2^n u(-n)$

c- $\alpha^n \sin(w_0 n)u(n) \qquad (|\alpha| < 1)$