1. Let \( \{X_n\} \) be an iid Gaussian random process with zero mean and variance \( R_X(0) = \sigma^2 \). Let \( \{U_n\} \) be an iid binary random process, independent of the \( X \) process, with \( \Pr(U_n = 1) = \Pr(U_n = -1) = 1/2 \). (All processes are assumed to be two-sided in this problem.) Define the random processes \( Z_n = X_n U_n \), \( Y_n = U_n + X_n \) and \( W_n = U_0 + X_n \), all \( n \).

Mean \( \mathbb{E}[Z_n] = \)

Covariance \( K_Z(k, j) = \)

PSD \( S_Z(f) = \)

Mean \( \mathbb{E}[Y_n] = \)

Covariance \( K_Y(k, j) = \)

PSD \( S_Y(f) = \)

Mean \( \mathbb{E}[W_n] = \)

Covariance \( K_W(k, j) = \)

PSD \( S_W(f) = \)