4.
$$E[X(t)] = E[Sin(At+B)] = 0$$

$$R_{X}(t) = E[X(t)|X(t+T)]$$

$$= E[Sin(At+B)|Sin(At+O+AT)]$$

$$= E[Sin(At+B)|Sin(At+O+AT)]$$

$$= E[-\frac{1}{2}(cos(2At+2O+AT)) - Cos(AT)]$$

$$= -\frac{1}{2}(E(cos(2At+2O+AT)) - E(cosAT)]$$

$$P_{X}(t) = Sin(At+B) - \infty - ct - \infty$$

$$E[X_{T}) = E(aX(t)+b) = b + aE(X(t)) = b + a m_{X}$$

$$R_{Y}(t) = E[(aX(t)+b)] - aX(t+T) + b = E[a^{2}X(t)|X(t-T) + abX(t+T) + b^{2}]$$

$$= iE[(X(t)|X(t-T)) + 2abm_{X} + b^{2} = a^{2}R_{X}(t) + 2abm_{X} + b^{2}]$$

$$= ARABAL$$

(2)
$$E.(\Upsilon_T) = E(AX(t) + B) = E(A)E(X(t)) + E(B)$$

$$= a M_X + b$$

$$= E(AX(t) + B)(AX(t) + D) = E(A^2X(t)X(t+t) + ABX(t) + ABX(t+t) + B^2)$$

$$= E(A^2)R_X(\tau) + 2 ab M_X + E(B^2)$$

$$= (G_1^2 + \frac{1}{4})R_X(t) + 2 ab M_X + (G_2^2 + b^2)$$

$$= (G_1^2 + \frac{1}{4})R_X(t) + 2 ab M_X + (G_2^2 + b^2)$$

$$= (G_1^2 + \frac{1}{4})R_X(t) + 2 ab M_X + (G_2^2 + b^2)$$

$$= (X(t+q) - X(t)) = 0$$

$$R_Y(t) = E(X(t+q) - X(t)) (X(t+\tau+q) - X(t+\tau+q) + X(t) + X$$

12. (1) Rxy (-c) = E(X(toc) Y(t)) = E(Y(t) X(toc)) = Ryx(c) 12) - | Rxy(te)|2 = { E(X(t)) Y(tet)] = E(X(t)) E(X(t)) = Px(0) Ryle $R_{xy}(\alpha) \leq \sqrt{R_{x}(\alpha)} \sqrt{R_{y}(\alpha)} + \sqrt{R_{y}(\alpha)} + \sqrt{R_{y}(\alpha)} + \sqrt{R_{y}(\alpha)} = 0$ $E(\frac{\pi}{2}) = E(\frac{\pi}{2}) = 0$ [(2022-4)X - (6+24-4) (X/E+5-4) = [(4) (4+5-6)) [(20-7) X (10) - X(10) X (16) - X(10) X (2+5) + X(10) X (16-02) = 20x (E) - (FRCE-G) - RX (T+9)