Assignment 10

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Question : EX 9.20

Show that if $x(t)$ is an SSS process and B is a random variable independent of $x(t)$, then the process $y(t) = x(t - \epsilon)$ is SSS.

Solution

$\underline{x}(t)$ is SSS , hence ,$P\left\{x(t) \leq y\right\} = F_x\left(y\right)$ doesnot depend on t.
The RVs $\underline{\epsilon}$ and $\underline{x}(t)$ are independent , hence ,

$$F_y(y) = P\left\{\underline{x}(t-\underline{\epsilon}) \leq y | \underline{\epsilon} = \epsilon\right\} = P\left\{\underline{x}(t-\epsilon) \leq y | \underline{\epsilon} = \epsilon\right\}$$
$$= P\left\{\underline{x}(t-\epsilon) \leq y\right\} = F_x(y)$$

is independent of t . Similarly for high order distributions.