ASSIGNMENT 10 : PAPOULLIS CHAPTER : 7 EXAMPLE - 7.11

AI21BTECH11016

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Outline

Question

The random variables x_1 and x_2 are jointly normal with zero mean. We shall determine their conditional density $f(x_2 \mid x_1)$.

Solution

$$a = \frac{R_{12}}{R_{11}} \tag{1}$$

$$Mean : E\{x_2 \mid x_1\} = ax_1 \tag{2}$$

$$Variance : {\sigma^2}_{x_2|x_1} = P \tag{3}$$

$$= E\{(x_2 - ax_1)x_2\} \tag{4}$$

$$= R_{22} - aR_{12} \tag{5}$$

Solution

Conditional density :

$$f(x_2 \mid x_1) = \frac{1}{\sqrt{2\pi P}} \exp^{-\frac{(x_2 - ax_1)^2}{2P}} \tag{6}$$