**ASSIGNMENT-II**

**MAT 2206 (CSE/ICT/CC)**

1. Let be a continuous random variable with pdf given by:

(a). Determine the constant

(b). Determine the cdf, and sketch its graph.

(c). If and are three independent observations from what is the probability that exactly one of these three numbers is larger than 1.5?

1. The following functions represents the cdf of a continuous random variable. In each case for and for where is the indicated interval. In each case, sketch the function , determine the pdf and sketch it.

(a). (b).

1. The percentage of alcohol in a certain compound may be considered as a random variable, where has the pdf:

(a). Obtain an expression for the cdf and sketch its graph. (b). Evaluate .

1. Suppose that the joint pdf of the two dimentional random variable is given by . Compute and
2. Suppose that the dimensions, and , of a rectangular metal plate may be considered to be independent continuous random variables with the following pdf’s.

Find the pdf of the area of the plate,

1. Let represent the life length of an electronic device and suppose that is continuous random variable with pdf . Let and be two independent determinations of the above random variable (That is, suppose that we are testing the life length of two such devices.) Find the pdf of the random variable
2. Suppose that is uniformly distributed over the interval (0, 1). Find the pdf of the random variable Find the expected value and variance of the random variable .
3. Suppose that is uniformly distributed over the triangle in figure (1).

(a). Obtain the marginal pdf of and of

(-1, 3)

O

y

x

(1, 3)

Figure (1)

(b) Evaluate and

(c). Evaluate the correlation coefficient.

1. Suppose that the following table (1) represents the joint probability distribution of the discrete random variable Evaluate all the marginal and conditional distributions. Also, find , the correlation coefficient.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X  Y |  | 1 | 2 | 3 |
| 1 |  | 1/12 | 1/6 | 0 |
| 2 |  | 0 | 1/9 | 1/5 |
| 3 |  | 1/18 | 1/4 | 2/15 |

Table (1)

1. Three balls are randomly chosen from an urn containing 3 white, 3 red, and 5 black balls. Suppose that we win $1 for each white ball selected and lose $1 for each red selected. If we let denote total winnings from the experiment, then find the probability distribution of . Also find and

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