AI1110 ASSIGNMENT-5

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***Abstract*—This document contains the solution for Assignment 4 (CBSE CLASS 12 CHAPTER 13 QUESTION-7)**

QUESTION 7 :

Two coins are tossed once, where

(i) E: tail appears on one coin, F: one coin shows head

(ii) E: not tail appears, F: no head appears

Solution :

X is the random variabe that represents the number of heads denoting the outcome of the experiment by $X \in \{0, 1, 2\}$

$$\Pr\left(X = k\right) = \begin{cases} \frac{1}{4}, & k = 0 \\ \frac{1}{2}, & k = 1 \\ \frac{1}{4}, & k = 2 \end{cases} \tag{1}$$

(i) Let E be the event of occurring tail on one coin and F be the event of occurring head on one coin.

$$\Pr\left(X = E\right) = \Pr\left(X = 1\right) = \frac{1}{2} \tag{2}$$

$$\Pr\left(X = F\right) = \Pr\left(X = 1\right) = \frac{1}{2} \tag{3}$$

$$\Pr\left(E \cap F\right) = \frac{1}{2} \tag{4}$$

$$\Pr\left(E|F\right) = \frac{\Pr\left(E \cap F\right)}{\Pr\left(F\right)} = 1 \tag{5}$$

(ii) Let E be the event of occurring tail on one coin and F be the event of occurring head on one coin.

$$\Pr\left(X = E\right) = \Pr\left(X = 2\right) = \frac{1}{4} \tag{6}$$

$$\Pr\left(X = F\right) = \Pr\left(X = 0\right) = \frac{1}{4} \tag{7}$$

$$\Pr\left(E \cap F\right) = \phi \tag{8}$$

$$\Pr\left(E|F\right) = \frac{\Pr\left(E \cap F\right)}{\Pr\left(F\right)} = 0 \tag{9}$$

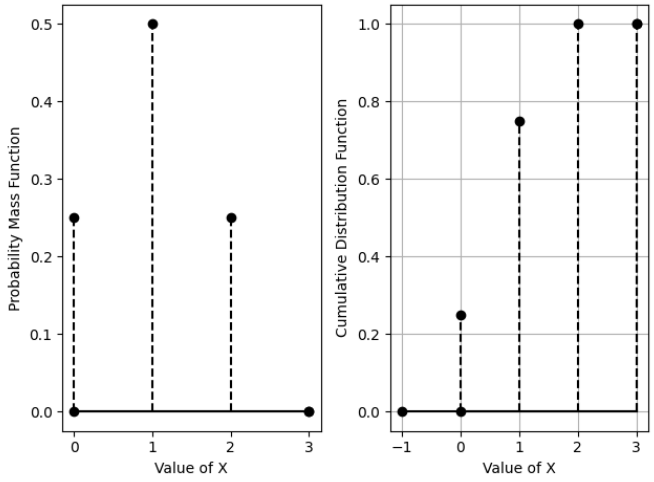

Fig. 0. Plot of the PMF (left) and CDF (right)