Let & Le a set of every possible out comes of a random experiment and & we me sample space.

P60: 0 -> [0,1]

St

PCC)>0

P(CIVCZ...) = P(CI) + P(CD)..... Cohere Ciare disjoint

PCC) is called the production set function. ST 9 9 9 MILE THEORY EXPENIENT OF REAL OF THE PARTY OF TH

Apprecia to the manage of the process of the proces Thm 1: For each CE & P(C)=1-P(C) CkCx are dispair MARKET AN WELFARE PARTY OF THE STATE OF THE

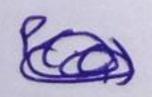
P(\$)=0 P(006)

CIRCZ are subset of C St GCCZ

P(G) = P(G, U (G, nG))

(A 3 ×) 19 3/1/39 For each CCG 0=PCC)=1

& C C C



Thm 5

 $P(C_1 \cup C_2) = P(C_1) + P(C_2) - P(C_1 \cap C_2)$ $P(C_1 \cup C_2) = P(C_1) + P(C_1^* \cap C_2)$ $P(C_1 \cup C_2) = P(C_1) + P(C_2^* \cap C_1)$ $P(C_2) = P(C_1 \cap C_2) + P(C_2^* \cap C_2)$ $P(C_1 \cup C_2) = P(C_1) + P(C_2) - P(C_1 \cap C_2)$

Random variobles

Defination: - Given a random experiment with a sample of

A function X which assigns to each element

CE & one and only one seal numbes

X(0) = X is called random variable.

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The space of X is the Set of year humbers (A = Fx; X=X/d)

if G themselver have real number X(C)= Z

so /A = G

Let A be a subset of A

Define Pr (XEA)

P(c) where C= { c; ce 6 and x(c) \(A \)

Notice Be(A) or Pr(XEA)
will satisfy all the theorems.

Example

Let G = (0,1) Let $P(C) = \int_C dx$ is $C = C \left(\frac{1}{4}, \frac{1}{2}\right)$ $P(C) = \int_C dx$ $\frac{1}{4}$

Define $\chi(0) = 3c + 2$ $A = \{x \neq 2cx < 5\}$ Let A = (2, 3) $\therefore c = (0, \frac{1}{3})$ $\Rightarrow P(c) = \frac{3}{3}dx$

Discrete random variable.

Let x denote a vandom variable with one dimensioned apaceA.

suppose 11 has finity many points.

Let f(x) he a junction

J:1A -> (0,1)

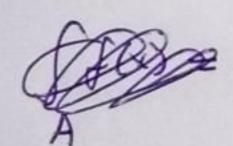
s st

 $\sum_{A} f(x) = 1$

when even $A \in A$ it can be expressed in terms stach a f(x) by

P(A) = Zd(x)

Continous type of random voriable



Let /A he one dimentional of and foo: 1A -> (0)1)st

Safex) dx = 1

x is said to be of continous type

if A C/A then

P(A) = Soundx

The notion of pat of one voriable X can be evaluated to notion of pat of two of more variable

X & Y are two discrete type or of the continous
type we have a distribution.

$$P(A) = f_{\delta}((x,y) \in A) = \sum_{A} f(x,y)$$

$$P(A) = \iint_{A} f(x,y) dxdy$$

This notion can be extended futher to n xandom variables

If d(x) is the pdf of a continous type of random variable x and is A is a set q(x); q(x) = P(x) =

if A is singletor $9 \times = 9$ $P(X \in A) = \int_{a}^{b} f(x) dx = 0$

This fact enable us to write

Pr(a < x < b) = Pr(a < x < b)

This helps us to change the value of the pdf
of a continous type of random variable at a single
point without aftering the distribution of X.

f(x) = ex x>0 o otherwise

coan he written s

fas = ex x > 6

6 others

More generally if two probability dansity tunctions of a random variables of the continuous type differ only on a set having probability zero, the two probability set facilities are exactly some.

D=x3 rol

4/hou at 21

= 61 × × 5

Let variable X have the probablity set functions PCA).

Take X to be a real number and consider the set (-\infty) for such P(A) The Probability

depends upon on point X.

we shall use F(00) & F(-00) to denote

lim F(x) & lim F(x) respectively

x > 00

Some properties

F(x) = F(y) + Pr(xe(y)x)

F(x) > F(y)

Pr(x x < x < x) = F(x) - F(y)

Pr(x=b) =
$$\lim_{h \to 0} f(x) + (x < b)$$

= $\lim_{h \to 0} F(b) - F(b-h)$

= $\lim_{h \to 0} F(x) - F(x)$

iv)

F is right continous

= $\lim_{h \to 0} f(x) - F(x)$

iv)

F is right continous

Suppose not $\lim_{h \to 0} f(x) - F(a)$
 $\lim_{h \to 0} f($

hence $K \notin (a, a+K)$

0=F(a+)-FCa)

.: sight continous