Session-2 (i) Poroleakility -

2). Random Varriable.

Expt: - Match between A &B

Sample Space - { Anis, Buins,

Event - (1) A doesn't lose

Probability - A number associated with each sample point.

/ 1 3 m $S = \{ 8_1, 8_2, 8_3, ---$, þn P2 P3 /

A: { »,, », »3 }

B= {13, Dy, Bg }

P(A) = k1+ k2+k3

P(B): \$3+ky+kg

C = AUB, 7 Min ; P(C) \$ P(A) + P/2B)

P(C) = | | + | 2+ | 2+ | + | + | + | = P(A) + P(B) - | 3

= P(A) + P(B) - P(A DB)

Theresetim

D= A NB

"Independent Events"

Dite: {1,2,3,4,5,6,3

As odd number comes P(A) = 1/2

B= even number 60mes. P(B) = }

Cord Example

A = queen comes

 $P(N): \frac{4}{57} = \frac{1}{13}$

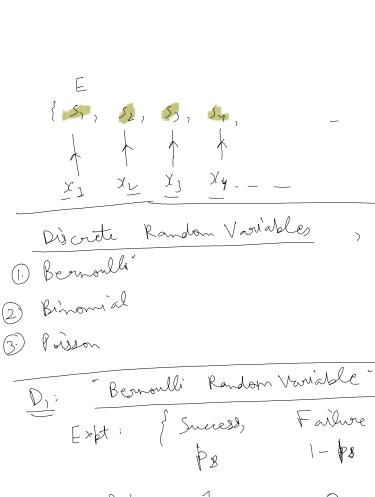
B= If ade comed

 $P(B) : \frac{13}{52} : \frac{1}{4}$

Session - 2 Page

(6.95)²⁵(0.05) 26) 6, Mb2 Mb3. - - - MB26 26 × (0.95)²⁵ × (0.05) P (neets his target) $= 26 \times (0.95)^{25} \times (0.05) + (0.95)^{26}$ ~ 0.62

2) If he devides not to go to Bilone. P(meeting the target) = P(exactly 25 days) + P(exactly 26 days) + P(exactly 27 days) $^{2+}(_{2}\times(_{0.95})^{25}(_{0.05})^{2}$ + $_{2}+(_{0.95})^{2}(_{0.05})+(_{0.95})^{27}$ 1. B, B, G, Gy B) B, G, B3 Gy- - G27 62 27 (2= 27× 26 627 $(0.95)^{2.5}(0.05)^{2}$



Expt: Success, Failure
$$X = \begin{cases} 1, & \text{product} \\ 1, & \text{product} \end{cases}$$

$$\frac{RV}{1} = \begin{cases} 1, & \text{product} \\ 0, & \text{product} \end{cases}$$

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$$\frac{RV}{1} = \begin{cases} 1, & \text{product} \\ 0, & \text{product} \end{cases}$$

3) Binomial Random Variable

Do an expt "r" times., each torial can result in success with probability "p". Porobability

$$X = \text{number of successed}$$

$$X = \begin{cases} 1 \\ 2 \\ 1 \end{cases}$$

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$$X = \begin{cases} 1$$

"10 times"
$$P(")$$
 (ones 10 times) = $\left(\frac{1}{6}\right)^{0}$

JE(X)= p1x1+ p2x2+-- +pnxn The tod Value of a Random Variable

(X)= p1x1+ p2x2+--- +pnxn Experted Value of a Random Variable 3-5" - Experted Value Prob 900 0.1 6 later times 0.) 1.0 1. (60k)+2.(60k)+3.(10k) +. _+6(30kx) 0.1 7.0 (6.1) + 2.(6.1) + 3(6.1) + 4(0.1) + 5(01) + 6 (0.5) 0.5 0 X = X, + X2 + - - - $E(X) = E(X_1) + E(X_2) + - - +$ = | + | + - - +

A LAB doing Covid testing gets 1000 samples to test everyday. However, due to the positivity rate drop in cases of Covid samples, the LAB is contemplating if it is better to mix the samples to get the result in lesser number of tests. Assuming 3% positivity rate, what is the number of samples that should be pooled together?

Scheme ' (1) Pool "k" samples trogether

(2) Test all the mixtures

(3) From the mixtures which give a "+ ve" report, test all the

bamples deparately.

Mimize: E("Cotal no. of tests") > Some bort of average or

expected value.

(3%)

(3%)

