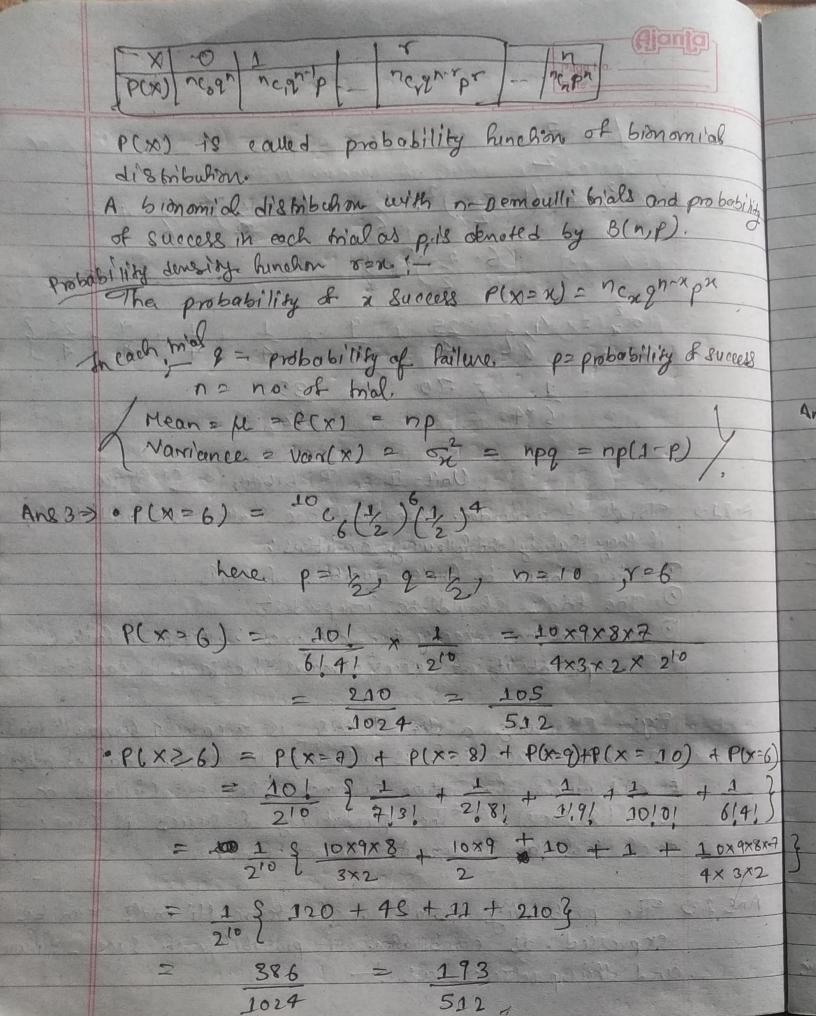
Unit- 1 Probability & Statishts AND Trials of a random experiment are called Bernoulli bially if they satisfy the bollowing conditions; O there should be like number of toials. The trials should be independent O each trial has exactly two outcomes is success or failure O The probability of success remains the same in each to'al. Eig! - Throwing a die 4 times is a case 4 sernoulli toials. in which each trial is independent in which trial of getting a odd number has two outerness eigher even (failure) or odd (8 wicess). The probability of success is some in each total as all are independent events. Ans 2=> The probability distribution of Bernoulli trials can be expressed as combination of probability of success failure and their product as !-



eleng stored maker to all a support



· P(X < 6) = P(x=0) + P(x=1) + P(x=2) + P(x=3) + P(x=4) + P(x=S) + P(x=6) = 1 5 1 + 10 + 48 + 120 + 420 + 10x9x8x2x6? SX9X3X2 = 1 9 596 + 252 = 848 = 53 = 1024 64P(X>1) = P(X=1) + -- P(X=10)Ans 4=) the prome property W=10 , b= 101 = 0.T , d= 1-9,1=0.8 $\frac{1!9!}{2!9!} \times (0.9)^{10} + \frac{10!}{2!9!} \times (0.9)^{9} (0.1)$ · · probability success 1's 104. = 0110 which i's very low & number of trials is 10 which is large compared to success probability we will use paisson's diemboling.

P(x=x) = 1xe-x here b = mean = np = 10x 6.1 = 1 $P(x \ge 1) = \sum_{i=1}^{10} (1)^{x_i} e^{-x_i} = e^{-1} \sum_{i=1}^{1} \frac{1}{1!} \frac{1}{2!} \frac{1}{10!}$

Ane 5 =>

1: The cards are drawn successfully with

replacement)

(P707

N = no of spades random discrete combble. No

$$P(x=5) = 11$$
 $(4)^{5} = 1$
 1024

$$P(x=3) = S_{c_3} q^2 \rho^3 = \frac{5!}{3! 2!} \times (\frac{3}{4})^2 \times (\frac{1}{4})^3$$

$$= 10 \times 9 = 195$$

Ans 6= Condition to use poisson's distribution!

The probability of success is very low

O along with conditions satisfy he bionomial distribution

& 2 meon 2 np

Variance = 52 = npg

Ins 7 >> x = no of defective hises found n > 200 moels

= 24. = probability of sefective



$$P(x \le 5) = \frac{5}{5} \int_{-\infty}^{\infty} e^{-\lambda}$$

$$w^{\text{fere}}, \ \lambda = np! = 2000 \times 2 = 4$$

$$P(x \le 5) = e^{-4} \begin{cases} 4^{\circ} + \frac{4^{\circ}}{1!} + \frac{4^{\circ}}{2!} + \frac{4^{\circ}}{3!} + \frac{4^{\circ}}{4!} + \frac{4^{\circ}}{5!} \\ -\frac{6}{5} + \frac{1!}{1!} + \frac{2!}{2!} + \frac{3!}{3!} + \frac{4^{\circ}}{4!} + \frac{4^{\circ}}{5!} \\ -\frac{6}{5} + \frac{1!}{1!} + \frac{2!}{2!} + \frac{3!}{3!} + \frac{4^{\circ}}{4!} + \frac{4^{\circ}}{5!} \\ -\frac{6}{5} + \frac{4^{\circ}}{1!} + \frac{4^{\circ}}{2!} + \frac{4^{\circ}}{3!} + \frac{4^{\circ}}{4!} + \frac{4^{\circ}}{5!} \\ -\frac{6}{5} + \frac{4^{\circ}}{1!} + \frac{4^{\circ}}{2!} + \frac{4^{\circ}}{4!} + \frac{4^{\circ$$

 $1 - e^{-2} \begin{cases} 2 + 2 + 1 \end{cases}$ $= 1 - 5e^{-2}$

$$P(x=0) = 92^{0}e^{-2} = e^{-2}$$

$$0!$$

$$P(x>1) = 1 - P(x \le 1)$$

$$= 1 - \{P(x=0) + P(x=0)\}$$

$$= 1 - \{2^{0}e^{-2} + 2^{1}e^{-2}\}$$

$$= 1 - \{2^{0}e^{-2} + 2^{1}e^{-2}\}$$

$$= 1 - e^{-2}\{1 + 2^{0}\} = 1 - 3e^{-2}$$

Ans 90 Suppose that in a sequence of trials we are interested in number of the trial on which byst success occurs.

The three assumptions for Bernoulli' totals are Satisfied but the extra assumption underlying the bionomial distribution is not, i'e', in is not lixed.

for xth to'al to occur horst success

thist (x-1) failures will come.

Therefore 1-

Therefore !
(Proposition of the surp of the surp.)

(State of the surp.)

(State of the surp.)

(State of the surp.)

(State of the surp.)

mean = 1

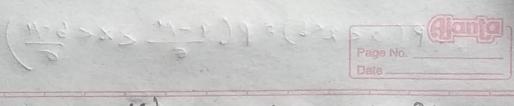
Standard deviation = 12

Variance = 9

p2

1= 0.05

ng 10%



P(x=6) = 9 (3) p by geometric Distribution p = 0.05 q = 1 - 0.05 = 0.95 $p(x = 6) = (0.95)^{5} 0.05 = 0.0386890469$ (& colculator) And 41=3 x=85 p=4 q=5 by Geometric p(x=5) = (5, 14, 1) = 825 Dishibutar Ans.12=) p=0.7 fish 2q= 1-0:7=0:3 $P(X=3) = (9,)^2 p = (0.3)^2 0.7 = 0.09 \times 0.7$ Aon 00063 I Average number of shots needed to hit target is mean of diembulian = 1 = 1 = 1.4286 Ang 133) In Normal Distribusion it 4=0 and o=1 it is called Standard normal Distribution. and probability den bity hinchon 18 given by $f(2) = 1 \cdot e^{-\frac{Z^2}{2}}$

Convert x into a standard normal variable by formula $z = x - \mu$

Find limit of 2 corresponding to limit of & by above bromula. Use standard normal delle for probability

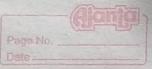
3	P(acx4b)? P(9-M < x<6-H) Page No. Date
-	
No.	Example: - If mean height is 151 cm of 500 shidens
	Standard deviation is Isem. Probability & no of Shiden between, 120 and 185 cm.
September 1	3) 14 = 151cm 0 = 15cm
	22 X-H
	0720 7120 20
The second second	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	$\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$
No.	19 15
10000	2 -31 4· 13 7 13
	-20067 < 2 < 0.267
	··· P(-2.067 < Z < 0.267) > P(-2.067 < Z < 0)
	+ P(042<0,267)
	mont table are well get 25 core from the
The second second	probability sensity hunchon.
1	72
	f(2) 2 1 e = 2 2 3 (0 - 20067,0)
	VZTT 22 (0,01267)
4	19 14-151 82 18 20 X-H
Total .	

Ans1

72120 22720-181 = -2.067

2=159 7 2 = 0.267

P(120 < x < 185) = P(-2067 < 2 < 0.267) = P(-2.067< ZCO) + P(062 CO.267)



P(120 < 2 < 188) = 0.4808 + 0.1084 = 0.8872 1. No. of Students = 500 x 0.5872 = 294 Ans 15>> A random variable x is said to have on exponential distribution with parameter 5>0, it its probability doubity hunchors its given by f(m) = { de-sn if x > 0 The distribution is concerned where we are concerned with exponential growth of decay of organisms or moters also $P(x \ge n) = \int_{-\infty}^{\infty} f(x) dx = \int_{0}^{\infty} h e^{-hx} dx$ $F(x) = P(x > x) \begin{cases} 1 - e^{-\lambda x} & x > 0 \\ 0 & x < 0 \end{cases}$ $1 = \frac{1}{2} = \frac{1}{$ Mean = $\mu = \int_{-\infty}^{\infty} x f(x) dx = \lambda \left[\frac{1}{-\lambda} x - \frac{e^{-\lambda \tau}}{\lambda^2} \right]^{\infty}$: Variance = Vár(x) = 1 2 Standard Lowlation = 1 Eg!- $f(x) = \{2e^{-2x}, x>0\}$

P(x>3) = fandn = $\int_{0.2e^{-2\pi}dx}^{\infty}$ $= -6 - e^{-6} = e^{-6}$ Mean = 1 2 1 Standard deviation = 0 = 1 = 1 distribution of the contract of the property of ANJ162) : $f(n) = \int_{0}^{\infty} \int_{0}^{$ 0 100.0 6 / 100 as distablishing as concerned whole we care for the $P(x > 1200) = \int \int de^{-\lambda x} dx$ = 15 [e-lx 700 = e-01001 x 1200 re e-1'2 20.301