Discrete DATE: Mohammad Sohail Aplitas The beight of students is a continuous orandom variable because it can take any value within a range (eg; 450cm, 740cm, 140.032 cm) etc. Even if we measure beight with institute precision, it will be continuous. soln:-The mean of a discrete random variable is, M: Z[n]: Zxip (n: ni) 4-(1)10.01)+ (a) 10.03)+ (3)(0.25)+(4)(0.35) + (5) (0.20) + (6) (0.+0)+ 17) (0.04) + 8 1/0.02 ·: 4: 4.26 Then, variance el, V41/2)= [(22)-(E/2)] or \$(n2)=12/0.01)+22/0.05/+340.05/+440.35/+ 52/0.20)+62/0.10)++2/0.04840.04) ey E [9]= 19:82

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Mohammad Schail Ablitar

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SD = /var(a) = 1.6724 5 1. 293 J 50/n:outcomes for a six-sided dice ore 1, 2, 3, 4, 5 86 each with porbability So, Expected Value: \
\[\begin{array}{c} \ E(n) = \frac{1}{2} \left + \text{2} + \text{3} + \text{4} + \text{5} + \text{6} \right] \end{array}

Comme (E[2]= 1 lataltset yetsets) 5 1 19 1

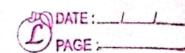
= 15. 1667

variance (var/n)= =(91) = -(E(2))-= +5.1667 - 3.52 = 2.9167

Mohammad Sohail Athtag .. Sofol= Vvai(n) = 12.9167 = 1.71 g 50/n:-Liver,

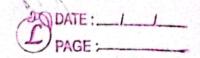
In this game, the player wins if all three win show the some face either head on false). Then, the possible outcomes are: 3 HEADS: P(3H)= +/8 3 TATIS: P(3T)= +/8 The total probability of winning is:
P(win)= P(3H)+ P(3T) = 0.25

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5. 50/p. lives, Flas: put for m=4,2,3. To satisfy the conditions of PMF. the sum must equal to 1 Play + Flash + plasset og K/11419/51 og KX1451 og R=1 -: KX 0.0714 8 50/n:wines The sum of porbabilities must equal to xx10.25 +0.25° +0.253)=1 ey K X 0.328=1 0.528 : K = 3.05 -: K=3 (approx.)

	Mohammad Lohail Atchtas
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7.	a 20/n:-
	lu'nen
	The sum of all Porbability must be
	The sum of all Porbability must be equal to 1.
	Then,
	: PMF = ptakt: 9kt +otl
dy	1=94+011
0	0441046-150
ø	12464601-42-1-1
0	100/4/1/6/6/6/1/6
	Dey +0x) (10x-1)(x+1)50
	50,
	. '. K = 1
	10 8
6)	soln!- 1
	The sup of all probability must equal
	to 1
6)	10/n:-
	P(n66) 11 the sum of the probabilities from at 1 to aso
	1:0 P(966): Kt aktakt 3kt Ktak
	using 2 = 4/10
dy	P(NL6)= 1: + dx1 + 2x1 + 3x1 + 1 + 2/1)2
	10 10 10 10 10 (10)
l (1	



٠	Ť	Plazex	0.83
-	-		

P(32916)-11 the sum of the probability for 754,5,6

P(32966): 3x+x+ax2

P(32456): 3XX + 1 + Q/1 12

: P/3L216/5 0.42 p

8. 10/n:

Lom is tossing on unfair win repeatedly untill the observes a head for the first time where p(H)=p. The no. g toeses untill the first head is observed follow a geometric with parameter p.

perbability Mall function (PMF) for the geometric distribution is:

p(y = y) = (1-p) y-1. p for y=1, 2,5

	Mohammad Lohail Abhton PAGE: PAGE:
	Henre, The distribution of y is per- metric with parameter p.
1	metor's with parameter p.
. 11	
9.	S0/0:
	liver,
	From & to the we are asked to find
	from a to ta. we are asked to find
	P(YZAL).
	The total number of possible outrome
	The total number of possible outrome when voiling two dice is 6x6=36
	The number of outcomes where the sum is less than on equal to H is 35 long one
	less than By equal to H is 35 long one
	outcome, sum is 12 is excluded)
	50, Porbability. p(YLM)= 35 =0.97 £
	36
0	

	Mohammad solail Afchfag DATE: PAGE:	
w	com:	
70	wines that I in to people struck by	/
	wiver that I in to people struck by bighting die, we want to madel sun	vival.
	let, of be a Bernoulli Landon you	jable
	where	
	Plsurival): 0.9	
	Pldeath): 0.1	
	2 1.1 1.11.2 1.1	
•	The expected value is!	
	E[n]: p(survival) 20.9 4	
-		
	. Soln:-	
	liver,	,
~_	I in de children in USA have food	
_	allesty and we select Random saw	ugle
4_	of as children we want to find the	2
han.	probability that exactly 3 delider he	ane
han.	a food allergy.	
Jan		
\	Using Binomial Protability	
~~	n= ds = no.g trids.	
~	probability of caecels (P) Jan : 0.0	5
	no. 9 success (K):3	
·		
\		
\		
SHORT THE RESERVE OF		The state of the s

	Molamora solail Aplan DATE:
	asing formula,
	P(x=R)= (2) /1 /px 11-p) 0-x)
	endeliberting the value
	substituting the values, P(X=3)= ds (0.05)= (0.95)22
	3/ (3/)
	p(x=3)=0.093Q.
ld.	soln:
	-Civen,
	For a Binomial distribution,
	Mean (11)= np=de x0.05 = 1.25
	variable (o) = np(1-p)= 25 10.05 10.95
	= 1.1875
	Standard Dewiation (0): VI.1845
	= 1.09 f
13.	
	wien.
	probability of computer existing is 5%
	probability of computer execusing is 5%. or p=0.05, with n=25 computers.
0.	Exactly 3 crasher
	using Binomial probability with K=3.
	P(X=3)= des [0.05] 0.95/22
	(3)
	~ 0.093 g

Mohammad Solait Aphtas 1. At most 3 washes. we sum the probabilities of 0,4, d. and & bradles. P(263): E/ds/10.05/2/0.95) RS-R ₹ 0.966 50/n:-Planeced in each trial = 4/5 = 0. a. and we are asked to find the probabilities for 0 success, 3 sweeks and a failures in B'trials. Plo success): 126, F=0 and p=0.2 P(100): 16 \ (0.2) 10.8/6 × 0.262 \$ For K=3 P(1=3)= /6 / 10.013 (0.8)3 P(1=3): 6! 10.2) 5/0.8) 3 ~ 0.0819 f

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e.	since there are 6 trials, a failures corres-
	port to 4 success : failures = n- sucess.
27,	10,
	P(x=4) = [6] 10.2)" 10.8/2
	-61 10.24 x0.82 4.21
	20.01536 8
-	
15.	50/n:-
	leives
	Plesally 3 civiles in fiel 1000 vides != }
~~	pleraetly 3 ciouses in first 1000 vides 1= 1
	NOW, Using Bindmial distribution, culere, n=1000, K=3 and p=0.005
V 2	culere, n=1000, R=3 and p=0.005
	Biromial 111/19 formula,
	Binomial 111/19 Formula, P(x=3) = [1000] [0.005] [0.995] 997
72.7	(3/
200	Wing approx. $P(x=3) \approx 1000 0.005 ^3 0.995 ^{997}$
	P(X=3) = 1000 (0.005) 3 (0.995) 937
	(3)
	× 0.1105

Mohammad Sohail Alchtag DATE: _____

16.	soln:
	luiven.
	p:0.005 n=1000
	P(2101=)
	we can use the poisson approxionation
	ve can use the poisson approximation for the binomial distribution instead of
	calculating each probability of n= 1,2,3,
	calculating each probability of M=+, R, 8, because 'n' 18 large and 'p' is
	Small
	for poilson approx.
	25 np= 1000 x 0.005
	=5
	poisson PMF &s.
	Plask)= 2e-2
	k!
	To findthe p(n > 10), we first find (pn+10)
	by summing the probabilities for of
	by summing the probabilities for of
	Grom 1.
	P(21 > 10)= 1-p(21/10)
	py p(n=10)=1-0.9682
	-: P (21210) 0.318
	exestes in the first 1000 sides is
	approx. 0.031. &