Let U., Uz, -- Un be n i'd uniformly distributed random variables on the interval (0,t) Let the set S = { U(1), U(2), U(3), .... U(n) 4 be the Sorted order of random variables. Usin willo be the ith order statistic of U, U, --- Un. let g(s, s, s, s, --- sn) be the joint density function
of {U, Uz ---- Un'y  $g(S_1, S_2, S_3 - \dots S_n) = \frac{1}{t^n}$   $S_i \in (0, t)$   $f(S_1, S_2, S_3 - \dots S_n) = \frac{1}{t^n}$   $f(S_1, S_2, S_3 - \dots S_n) = \frac{1}{t^n}$ its because there one of permutations of the Sequence (S, 52 -.... Sn) & All. of them have same order stastistic

12 So we need to find;				731
of the n arrival times is same as  the joint distailation by $V(1)$ , $V(n)$ i.e., the order statistic of n Uniformly distributes  12 So have see need to find;  12 P( $t_1=S_1$ , $t_2=S_2$ , $t_n=S_n$   $N(t)=n$ ) = $P(t_1=S_1,t_n=S_n,N(t)=1)$ 13 The terms of intervarival times.  3  P( $X_1=S_1$ , $X_2=S_2$ , $X_3=S_3=S_3$	9 Now	we need to	show that the	joint distocibution
12 So we we need to find; 12 P( $t_1 = S_1$ , $t_2 = S_2$ ,	of th	e n arrival	times is sa	me as
12 So we we need to find; 12 P( $t_1 = S_1$ , $t_2 = S_2$ ,	10 the	joint distail but	Han of Ucis.	Ucn
12 So we we need to find; 12 P( $t_1 = S_1$ , $t_2 = S_2$ ,	i.e.	, the order s	Hatistic of n	Uniformly distribut
$P(t_{1}=S_{1}, t_{2}=S_{2}, \dots, t_{n}=S_{n}   N(t)=n) = P(t_{1}=S_{1}, \dots, N(t)=n)$ $= P(x_{1}=S_{1}, t_{2}=S_{2}, \dots, N(t)=n)$ $= P(x_{1}=S_{1}, \dots, N(t)=$	11 Y-U	-5 1 80	CAN HELLEN	r cro words
$P(t_{1}=S_{1}, t_{2}=S_{2}, \dots, t_{n}=S_{n}   N(t)=n) = P(t_{1}=S_{1}, \dots, N(t)=n)$ $= P(x_{1}=S_{1}, t_{2}=S_{2}, \dots, N(t)=n)$ $= P(x_{1}=S_{1}, \dots, N(t)=$			a siedistrifia la	
$P(t_{1}=S_{1}, t_{2}=S_{2}, \dots, t_{n}=S_{n}   N(t)=n) = P(t_{1}=S_{1}, \dots, N(t)=n)$ $= P(x_{1}=S_{1}, t_{2}=S_{2}, \dots, N(t)=n)$ $= P(x_{1}=S_{1}, \dots, N(t)=$	12 So La	ex we need to	find;	
P(N(t)=n)  In terms of inter arrival times. $P(X_1 = S_1, X_2 = S_2, X_3 = S_3 = X_1 = X_1 = S_1 = X_2 = S_1 = X_2 = S_2 = X_3 = S_3 = X_4 = X$			1.4 / 3	200000
P(N(t)=n)  In terms of inter arrival times. $P(X_1 = S_1, X_2 = S_2, X_3 = S_3 = X_1 = X_1 = S_1 = X_2 = S_1 = X_2 = S_2 = X_3 = S_3 = X_4 = X$	>1 P(t)	=S, t= S2,	ty=Sh N(t)=n)	= PCt1=3,th=3h,NO
In terms of inter arrival times. $P = P(X_1 = S_1, X_2 = S_2 - S_1, X_3 = S_3 - S_4, X_4 = S_1 - S_4)$ $P = P(X_1 = S_1, X_2 = S_2 - S_1, X_3 = S_3 - S_4, X_4 = S_1 - S_4)$ $\frac{1}{6}$				
$P = P(X_1 = S_1, X_2 = S_2 - S_3 - S_2 - X_n = X_n - S_{n-1})$ $= P(X_1 = S_1, X_2 = S_2 - S_1, X_3 = S_3 - S_2 - Y_1 - Y_1 - S_n)$ $= P(X_1 = S_1, X_2 = S_2 - S_1, X_3 = S_3 - S_2 - Y_1 - Y$	2	3,000	1 = (3	r CN(E)=n
$P = P(X_1 = S_1, X_2 = S_2 - S_3 - S_2 - X_n = X_n - S_{n-1})$ $= P(X_1 = S_1, X_2 = S_2 - S_1, X_3 = S_3 - S_2 - Y_1 - Y_1 - S_n)$ $= P(X_1 = S_1, X_2 = S_2 - S_1, X_3 = S_3 - S_2 - Y_1 - Y$	In +	terms of inter	arrival times	
$P = P(X_1 = S_1, X_2 = S_2 - S_1, X_3 = S_3 - S_2 - S_3 - $	3		1	1
$P = P(X_1 = S_1, X_2 = S_2 - S_1, X_3 = S_3 - S_2 - S_3 - $		00		· · · · · · · · · · · · · · · · · · ·
6	400 #	X	2 = 52 - 51 , X3 = 53	S Xn= Xn-5n-6)
6	11:60	order Spanicalis	to happy	an thought and
6	5	1 (1)	by Ching du	roup of
6	r = PCX	=S, X= SS, X	3=53-52 4Xn=5n-	sn-1 , xn+1 > t-sn)
PCN(t)=n)	6	110	= (2/ - 2	2021t
$\frac{1}{2}$ PCN(H)=n)				
	7	PLNC	ナリ=カ)	24.

