



LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – STATISTICS

SECOND SEMESTER – APRIL 2025

UST2MC01 – DISTRIBUTION THEORY



Date: 25-04-2025

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

SECTION A - K1 & K2 (CO1)

Q.No	Levels	Answer ALL the Questions	(10 x 2 = 20)
1	K1	Define geometric distribution.	
2		Give area property of normal distribution	
3		The average lifetime of a computer chip was estimated to be 5 years. If the lifetimes of the computer chip follows an exponential distribution, then what variation in the lifetimes can be expected?	
4		Define F-distribution	
5		Obtain the distribution of $X_{(n)}$ from $U[0,1]$	
6	K2	Give the expression for skewness of a binomial distribution and find for what value of p skewness becomes zero	
7		If $X \sim C(\lambda, 0)$, then prove that $f(x) = f(-x)$	
8		Prove that $\beta(m, n) = \beta(n, m)$	
9		Obtain the form of a density when we substitute $v=n-1=1$ in the pdf of t-distribution	
10		Consider the random sample: 20, 11, 21, 18, State and prove Lindeberg-Levy central limit theorem	

SECTION B – K3 & K4 (CO2)

		Answer ALL the Questions	(4 x 10 = 40)
11	K3	Discuss memory lack property of Geometric distribution	
12		[OR] Obtain moment generating function of normal distribution	
13		Obtain the relationship among t, F and Chi-Square distribution	
14		[OR] Derive Fisher's t-distribution.	
15	K4	Obtain mode of a Poisson distribution	
16		[OR] Discuss the properties of normal distribution	
17		Find the mean and variance of beta distribution of second kind	
18		[OR] Obtain the distribution of n^{th} order statistics	

SECTION C – K5 & K6 (CO3)

Answer ALL the Questions

(2 x 20 = 40)

19	K5	a) Discuss the additive property of Binomial Distribution. b) Discuss the additive property of Poisson distribution
20		[OR] If X and Y are independent gamma variates with parameters m and n respectively, then obtain the distribution of $U=X+Y$ and $V=X/(X+Y)$.
21	K6	Show that the normal distribution as a limiting form of binomial distribution
22		[OR] State and prove Lindeberg-Levy central limit theorem.

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