

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2024
(Third Semester)

Branch - STATISTICS

PROBABILITY DISTRIBUTION

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Nature of the binomial random variable X is (a) Quantitative (b) Discrete (c) Continuous (d) Qualitative	K1	CO1
	2	What type of events is the Poisson Distribution commonly used to model? (a) Continuous events (b) Discrete events (c) Independent event (d) Dependent event	K2	CO1
2	3	In negative binomial distribution each trial can result within how many outcomes (a) 1 or 2 (b) 1 and 2 (c) 2 (d) 2 and more	K1	CO1
	4	In geometric distribution the trials will be (a) Dependent (b) Independent (c) 2 outcomes (d) fixed probability	K2	CO1
3	5	In normal distribution the curve will be (a) Bell shaped (b) Triangle (c) Symmetrical Bell Shaped (d) Normal curve	K1	CO1
	6	Rectangular variate X on the interval (a, b) is written as (a) $X \sim U[a, b]$ (b) $X \sim R[a, b]$ (c) Uniform and Rectangular (d) $1/(b-a)$	K2	CO1
4	7	Exponential distribution is also known as (a) Negative distribution (b) Positive distribution (c) Gamma distribution (d) Uniform distribution	K1	CO1
	8	Who is the inventor of probability (a) Girolamo Cardano (b) Augustin (c) Paul Nobis (d) Srinivasa Varadhan S. R.	K2	CO1
5	9	When we are taking samples by random what it is called (a) Random sample (b) Systematic sample (c) Sequential sample (d) Multiple sampling	K1	CO1
	10	Chi-square distribution is known as (a) Goodness of fit (b) Fitness for use (c) Probability Distribution (d) Cumulative Probability Distribution	K2	CO1

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Define Binomial distribution and state its important conditions.	K1	CO1
		(OR)		
	11.b.	A manufacturer of cotter pins knows that 5% of his product is defective. If he sells cotter pins in boxes of 100 and guarantees that not more than 10 pins will be defective, what is the approximate probability that a box will fail to meet the guaranteed quality?	K4	CO1
2	12.a.	Define and derive mean and variance of the Negative Binomial Distribution.	K2	CO1
		(OR)		
	12.b.	Define Hyper Geometric Distribution and derive its mean and variance.	K2	CO2
3	13.a.	Brief the characteristics of the Normal Distribution and Normal Probability curve.	K2	CO2
		(OR)		
	13.b.	Give The Moments of rectangular Distribution and it's the mean deviation about mean.	K2	CO2
4	14.a.	Explain Exponential distribution with examples.	K3	CO2
		(OR)		
	14.b.	Discuss in detail the Beta distribution first and second king.	K2	CO2
5	15.a.	Describe in detail about the sampling distribution.	K2	CO2
		(OR)		
	15.b.	State the applications of f-distribution.	K2	CO2

SECTION -C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Define Poisson Distribution and also derive the Moments of Poisson Distribution	K2	CO2
2	17	Construct moments of generating function of the multinomial distribution and its properties.	K2	CO2
3	18	Derive Normal Distribution with its median, mode and Moment Generating Function.	K2	CO2
4	19	Derive mean, variance and moment generating function of the Gamma distribution.	K2	CO2
5	20	Derive the relationship between the t, f and chi square distribution.	K2	CO3

Z-Z-Z

END