



SRI SATHYA SAI INSTITUTE OF HIGHER LEARNING

(Deemed to be University)

Department of Mathematics and Computer Science

CIE-I

Topics: Elements of Probability & Discrete Random Variables

UDSC-201: Probability and Statistics	Instructor: Dr. D Bhanu Prakash	Date: 07-08-2026
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Q1: a. State total probability rule for two events A and B. *[Marks: 2 | BTL-1]*

b. Explain the significance of Bayes' theorem in revising probabilities, and describe how prior probability differs from posterior probability. *[Marks: 2 | BTL-2]*

Q2. Two events A and B are such that $P(A) = 0.4$, $P(B) = 0.5$, and $P(A \cap B) = 0.2$. Determine whether A and B are independent. Using the addition rule, find $P(A \cup B)$, and analyze how the answer would change if A and B were mutually exclusive instead. *[Marks: 2+2+2 | BTL-4]*

Q3: Compute the mean of a discrete binomial random variable. *[Marks: 4 | BTL-3]*

Q4. A discrete random variable X has the probability mass function $P(X = x) = k(x + 1)$ for $x = 0, 1, 2, 3, 4$, and 0 otherwise. Find the value of k, construct the cumulative distribution function F(x), and compute E(X) and Var(X). *[Marks: 1+1+2+2 | BTL-3 | CO: CO2]*

— End of Question Paper —