

ACHARYA A. V. PATEL JUNIOR COLLEGE, SVKM
EXCELLENCE PROGRAM - SYJC (SCIENCE), 2019-2020
SYNOPSIS
MATHEMATICS & STATISTICS – PART 2
BINOMIAL DISTRIBUTION [3 MARKS FOR H.S.C.]

❖ **Bernoulli Trial :**

A trial of a random experiment is called Bernoulli trial if it has only two possible outcomes, that is, success or failure.

Let p be the probability of “success” and q be the probability of the “failure” in a single trial, where $q = 1 - p$

Hence $p + q = 1$.

❖ **Binomial Distribution :**

The p.m.f. of binomial distribution is given by

$$P[X = x] = {}^nC_x p^x q^{n-x}, \quad x = 0, 1, 2, \dots, n; 0 < p < 1 \text{ and } q = 1 - p$$
$$= 0, \quad \text{otherwise}$$

Notation : $X \sim B(n, p)$

❖ **Expected value, Variance and Standard Deviation :**

Mean or Expected value of X is

$$\mu = E(X) = np$$

Variance of X is

$$\text{Var}(X) = npq$$

Standard Deviation of X is

$$\sigma_x = \sqrt{npq}$$