

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

FIRST YEAR (BATCH 2015-18)

B.A./B.Sc. SECOND SEMESTER (January – June) 2016

Mid-Semester Examination, March 2016

Date : 19/03/2016

Time : 12 noon – 1 pm

STATISTICS (General)

Paper : II

Full Marks : 25

[Use a separate Answer Book for each group]

Group – A

Answer **any three** questions of the following :

(3 × 5)

1. Suppose you are playing a game of throwing darts at a board with your friend. One will win the game who can hit the bull's eye at the centre of the board thrice. Your chance of hitting the bull's eye is 0.6 and this remains constant from throw to throw. Find the probability that you require 5 throws to win the game.
2. If X is a symmetrical binomial variable with number of trials $n = 36$, calculate $E[X(X-1)]$.
3. A car hire firm has two cars which it hires out every day. The number of demands for a car on each day is a Poisson random variable with an average of 1.5. Find the probability that on a particular day.
 - a) neither Car is hired
 - b) some demand is refused[Given $e^{-1.5} = 0.2231$]
4. A grocery display contains 25 broccolis of which 11 are organic and 14 are commercial. Let X denote the number of organic broccolis in a sample of six randomly selected broccolis. Find the probability means function of X . Also find $E(X)$ and $V(X)$.

Group – B

Answer **any two** questions of the following :

(2 × 5)

5. Obtain the tri-variate linear regression equation of X_1 on X_2 and X_3 .
6. Define multiple-correlation coefficient and partial correlation coefficient and indicate how they differ from total correlation coefficient.

Also explain, what do you mean by the residual variance $\sigma_{1.23}^2$?

7. Prove that $R_{1.23} = \sqrt{1 - \frac{\sigma_{1.23}^2}{\sigma_1^2}}$, where the symbols have their usual significance.

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