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**End Semester Examination of Semester–I, 2015**
**Subject : STATISTICS (HONS.) (UG)**
**Paper : 102 (Gr. A)**
**Full Marks : 20**
**Time : 1 Hr.**

*The figures in the margin indicate the marks corresponding to the question.*

*Candidates are requested to give their answers in their own word as far as practicable.*

*Illustrate the answers wherever necessary.*

## Group A

Answer **any one** out of two questions : 10x1=10

1. a) Define ordinal data with example. 2

   b) How, in your opinion, should an average change when all values of the variables are increase or decreased

      i) by the same amount?

      ii) in the same proportion? 4

   c) Let x be a variable assuming the values 1, 2, ....., k and Let $F_1' = n$, $F_2'$, .... $F_k'$ be the corresponding cumulative frequencies of the greater than type.

      Show that $\bar{x}=\frac{1}{n}\sum_{i=1}^{k}F_i'$. 4

2. a) Show that Pearson's Second measure of Skewness must lies between –3 and +3. 4

   b) For a set of n values of a variable suppose S and R are the s.d and range respectively.

   Prove that $\frac{R^2}{2n} \le s^2 \le \frac{R^2}{4}$. 6

## Group B

Answer **any one** out of two questions : 6x1=6

3. Show that the standard deviation S of a set of n observations $x_1, x_2, \ldots x_n$ is given by

   $$ns^2 = \sum_{i=2}^{n} \frac{i}{i-1}(x_i - \bar{x}_i)^2, \text{ where } \bar{x}_i = \sum_{j=1}^{i} \frac{x_j}{i}$$

   for i = 2, 3, .... , n

4. Using Cauchy-Schwartz inequality or otherwise, prove that $b_2 \ge 1$. Discuss the case where $b_2 = 1$.

## Group C

Answer any two out of four questions : 2x2=4

5. If A.M. and G.M. of two positive real numbers are 25 and 15 respectively, then find their H.M.

6. Define Co-efficient of variation and explain its uses.

7. Point out the merits and limitations of the range as a measure of dispersion.



8. If 5y – 4x = 10 is the relation between two variables x and y, median of x is 5, find the median of y.