B.A. (Honours) Examination, 2016

Semester-I

Integrated Mathematics and Statistics

Course – S-1.1.5.P.1 (Subsidiary)

(Statistics-I)

Time: 3 Hours **Full Marks: 40**

Questions are of value as indicated in the margin.

Answer ***any four*** questions.

1. (a) Distinguish between a variable and attribute with examples.

   (b) Define a discrete and continuous variable with examples.

   (c) Tabulate the following information :

   The total no. of accidents in Southern Railway in 1960 was 3500 and it decreased by 300 in 1961 and by 700 in 1962. The total no. of accidents in Meter Gauge Section showed a progressive increase from 1960 to 1962. It was 245 in 1960; 346 in 1961 and 428 in 1962. In the Meter Gauge section "Not Compensated" Cases were 49 in 1960, 77 in 1961, and 108 in 1962. Compensated Cases in the Broad Gauge Section were 2867,2587 and 2152 in these three years respectively. 2+2+6=10

2. (a) Prepare a frequency distribution table with class intervals 60-79, 80-99, 100-119 etc. from the following data (Tally marks must be shown)

   96, 130, 63, 115, 145, 99, 118, 104, 126, 72, 77, 87, 151, 81.
   142, 122, 110, 131, 98, 96

   (b) Draw the Histogram and Frequency Polygon for the above distribution on Graph Paper. 4+6=10

3. (a) Show if $\bar{x}$ is the arithmetic mean of the quantities $x_1, x_2, x_3 .... x_n$ then $\sum_{i=1}^{n}(x_i - \bar{x}) = 0$.

   (b) Prove that $\frac{1}{n}\sum_{i=1}^{n}(xi - A)^2$ is the least when $A = \bar{x}$, $x_1, x_2 .... x_n$ are the observations, A is any arbitrary constant and $\bar{x}$ is the arithmetic mean.

   (c) If $Yi = \frac{xi - c}{d}$ then show that $\bar{x} = c + d\bar{Y}$ 2+6+2=10

P.T.O.

4. (a) Compute the mean weekly wages of the 65 employees working in a factory from the frequency table give below using the base shifting method.

x :	55	65	75	85	95	105	115
f :	8	10	16	14	10	5	2

(b) During a given month ten salesman in an automobile dealership sold 13, 17, 10, 18, 17, 9, 17, 13, 15, 14 cars respectively. Find (i) the median and (ii) Mode. 6+4=10

5. (a) The arithmetic mean of two observation is 25 and their geometric mean is 15 find

(i) their harmonic mean and (ii) the two observations

(b) Find the median and median class of the data given below:

Class boundaries :	15-25	25-35	35-45	45-55	55-65	65-75
Frequency :	4	11	19	14	0	2

4+6=10

6. (a) Prove that the S.D. is independent of any change of origin but is dependent on the change of scale.

(b) Find the mean and the standard deviation of the first n natural numbers. 5+5=10

7. (a) Find out the S.D. from the following table:

x :	5	15	25	35	45	55	65	75
f :	3	7	9	23	15	8	6	4

(b) For a group of 50 boys the mean score and the S.D. of scores on a Test are 59.5 and 8.38. For a group of 40 girls the same results are 54 and 8.23. Find the mean and S.D. of the combined group of children. 5+5=10

8. (a) Find the first three moments about 8 of the data 6, 7, 10, 9, 12.

(b) Find the first three raw moments and Central moments for the data 2, 5, 8, 9. 4+6=10

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