Indian Statistical Institute, Bangalore

M.S. (QMS) First Year

First Semester – Statistics for Decision Making - I

Max. Marks: 40 Duration: 3 Hrs Date: September 22, 2023

Answer 1 and 2 and any two from the rest.

1. Following are the marks obtained by students in mid-sem and end-sem exam examinations of a course.
   i) Draw the scatter plot and comment.
   ii) Find the correlation coefficient between them.

Mid-term	77	50	71	42	81	84	96	99	67
End-sem	82	66	78	54	57	85	90	92	60

2. a) Draw a suitable diagram to show the relative contributions of the different continents to the total world population: (6)

Continent	Population (in millions) in 1968
Africa	336
North America	309
South America	180
Asia	1946
Europe	455
Oceania	19

   b) Daily number of accidents in a city for 30 days are given below. Make a suitable diagrammatic representation of the data. (4)

No. of accidents	1	2	3	4	5	6
Frequency	3	6	11	4	4	2

3. a) Distinguish between ratio scale and interval scale. (3)
   b) Show that, if $\overline{x_1}$ and $\overline{x_2}$ are two subgroup means, then their composite mean will lie between $\overline{x_1}$ and $\overline{x_2}$. (4)
   c) What do you mean by a relative measure of dispersion? (3)
4. a) Show that, range depends only on change of scale ant not on change of origin. (4)
   b) Show that mean deviation is minimum when measured about its median. (6)
5. Compute a suitable measure of central tendency and dispersion for the following data on marks distribution of students in a competitive examination. (10)

Marks	Number of students
20 or below	15
21 to 30	24
31 to 50	78
51 - 70	43
70 and above	16

6. a) Define positive and negative skewness. What do you mean by kurtosis of a frequency distribution? (5)
   b) Show that correlation coefficient lies between -1 and + 1.