Paper / Subject Code: 81119 / Statistics : Paper I

3 Hours | Total Marks: 100

N.B.: 1. All questions are compulsory.
2. Use of calculator allowed.

Q.1] (a) Correct the following if necessary: (10)
(1) Population is a finite subset of sample. (02)
(2) Data from a news paper is a primary data. (02)
(3) Temperature of a day represents a discrete random variable. (02)
(4) Kutosis measures departure from symmetry. (02)
(5) Median is affected by extreme values. (02)

Q.1] (b) Answer in one sentence: (10)
(1) Distinguish between qualitative and quantitative data. (02)
(2) Explain briefly SRSWOR. (02)
(3) State the formula for mode for grouped data, explaining the notations. (02)
(4) Explain the term negatively skewed distribution. (02)
(5) Define r^{th} central moment for ungrouped and grouped data. (02)

Q.2] Attempt any **TWO** sub-questions: (20)
(1) What is a Questionnaire? What are the requisites of a good Questionnaire? (10)
(2) Explain the term scale of measurement. Write short note on (i) ordinal scale and (ii) Ratio scale of measurement. (10)
(3) (i) State conditions for two attributes A and B to be completely associated and completely dissociated. State the type of association between attributes A and B for the following data: (05)
$(\alpha\beta) = 120$, $(\alpha) = 300$, $(\beta) = 200$ and $(B) = 300$.
(ii) In usual notations, prove that $Q = 2Y/(1+Y^2)$. (05)
(4) (i) What is tabulation? What are its objectives? (05)
(ii) Describe various parts of a statistical table. (05)

Q.3] Attempt any **TWO** sub-questions: (20)
(1) (A) Explain weighted and combined Arithmetic mean. (05)
(B) State merits and demerits of mode. (05)
(2) Write short note on (i) Histogram, (ii) Frequency polygon. (10)
(3) (A) Write a note on Box and Whisker plot. (05)
(B) Draw less than ogive for the following data: (05)

Weight (in Kgs.):	40-45	45-50	50-55	55-60	60-65	65-70	70-75
No. of Persons :	5	10	18	26	22	15	4

Hence, find median.
(4) For the following measures of central tendency, state the formula in each case by explaining clearly all the notations used: (10)
(i) Lower quartile, i^{th} decile and i^{th} percentile for grouped frequency distribution,
(ii) Geometric mean and Harmonic mean for raw data.

Q.4] Attempt any **TWO** sub-questions: (20)

(1) Explain the concept of kurtosis. Discuss its various types. State various measures of kurtosis and their interpretations. (10)

(2) Define standard deviation and variance. Prove that standard deviation is invariant under shift of origin, but is affected by change in scale. (10)

(3) Define r^{th} raw moment about zero, μ'_r. Derive expressions for first four central moments in terms of raw moments about zero. (10)

(4) (A) Define mean deviation from mean and quartile deviation for grouped data. (05)

(B) State relative measures of skewness. (05)

Q.5] Attempt any **FOUR** sub-questions: (20)

(1) What is time series data and cross sectional data? Explain with illustration. (05)

(2) Write a note on Schedule. (05)

(3) If $(\alpha\beta) = 165$, $(\alpha) = 510$, $(\beta) = 250$ and $(B) = 480$, find Yule's coefficient of association and comment. (05)

(4) Draw stem and leaf diagram for the following data: (05)
52, 61, 71, 86, 57, 63, 48, 70, 69, 62, 47, 45, 61, 77, 52, 62, 44, 58, 56, 40, 82, 61, 51, 50, 49, 75, 72, 80.

(5) For the following distribution mode is 65. Find the value of 'a': (05)

Class-interval:	20-40	40-60	60-80	80-100	100-120
Frequency :	5	18	a	10	3

(6) Explain the concept of measures of dispersion. (05)

(7) If the values of second and fourth central moments are 19.42 and 837.31 respectively, find β_2 and comment on the answer. (05)
