Seat No-.........

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First Year B.Sc. (Mar-2020)
End Semester Backlog Examination, (2019 Pattern) Semester – I

Course Code: 19ScStaU101   **Course Name:** Descriptive Statistics-I
Date: 16.03.2020   **Time:** 10.00 a.m-12.00 pm
[Time: 2 Hours]   [Max Marks: 60]

Instructions:-
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Use of statistical tables and calculators is allowed.
4. Symbols have their usual meaning.

Q.1) Attempt each of the following:

a) Choose the correct alternative for each of the following: (1 mark each)
    i) If 5 is subtracted from each observation of a set, the arithmetic mean is
        A) Increased by 5   B) Decreased by 5
        C) 5 times to original mean   D) Not affected.
    ii) A Cumulative frequency curve is used to represent ------ graphically.
        A) Median   B) Mode   C) Mean   D) Origin
    iii) The values of coefficient of kurtosis based on moments for mesokurtic distribution is
        A) 0   B) Positive   C) Negative   D) 3
    iv) Yule's coefficient of association lies between
        A) $[0, 1]$ B) $[-1, 1]$ C) $(0, \infty)$ D) $(-\infty, \infty)$

    v) In SRSWR method, the sample size at each draw is -----------.
        A) Increasing   C) Decreasing
        B) Fixed   D) None of the above.

b) Solve the following :   (2 marks each)
    i) Define the term random sample with one illustration.
    ii) State the two merits of median.
    iii) Define the term: Relative frequency of a class.
    iv) Define the term Mode. Also state the formula for mode in case of grouped
       frequency distribution.
    v) Define the term kurtosis with their types.

Q.2) Attempt any three from the following: (5 marks each)
    a) Explain Cluster random sampling with illustrations.
    b) Given that arithmetic mean, mode and variance of a certain data are
      160, 157, 2500 respectively. Find
        i)   Karl pearsons coefficient of skewness
        ii) Coefficient of variation
    c) The first 4 moments about the value 4 are 1.5, 17, -30 and 308 respectively.
      Find first 3 central moments.
    d) Given that N= 100, (A) = 470, (B) = 620, $(\alpha\beta)$ = 230. Verify whether A and B
      are associated? Justify.
    e) With usual notations, show that $\beta_2 \geq \beta_1 + 1$

Q.3) Attempt any three from the following: (5 marks each)

    a) Explain the term skewness using suitable diagrams. State the measure of skewness.

    b) Define α % trimmed mean. Calculate 10 % and 20 % trimmed mean for the following data :

$$85, 65, 48, 59, 20, 86, 94, 78, 96, 69$$

    c) Show that Standard deviation is greater than or equal to mean deviation about mean.

    d) Mean and variance of a certain data of 100 observations are 10 and 45 respectively. At the time of rechecking it is found that observation 40 was misread as 14. Calculate correct arithmetic mean and variance.

    e) What is Yule's coefficient of association? Show that it lies between -1 to 1.

Q.4) Attempt any three from the following: (5 marks each)

    a) Test whether the attributes A and B are independent, given that

$$(AB) = 20, (\alpha B) = 15, (A\beta) = 10 \qquad , (\alpha\beta) = 55$$

    b) The mean and variance of the distribution are 30 and 64 respectively and karl pearsons coefficient of skewness is 0.25. Find mode and median.

    c) Distinguish between SRSWR and SRSWOR method.

    d) Define the term central tendency. State the important three measures of central tendency and compare them.

    e) Two samples of sizes 40 and 50 having same arithmetic means and standard deviations 20 and 10 respectively. Find the variance of combined group

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