



A Charutar Vidya Mandal's Institution
V.P. & R.P.T.P. SCIENCE COLLEGE
 (AUTONOMOUS) (Grant-in-Aid)
 Affiliated to Sardar Patel University
 VALLABH VIDYANAGAR-388120



Bachelor of Science (Semester 1) External Examination - 2024
 US01MISTA01: Descriptive Statistics for Univariate Data

Date: 20-11-2024 (Wednesday)

Time: 11:00 AM to 12:30 PM (1.5 HRS.)

Total marks :25

Note: (i) Q.2 and 3, each sub question is of 5 marks (ii) Graph paper will be provided on request

Q.1 Write the most appropriate answer from the following multiple-choice questions. [05]

- (1) The first three moments about the mean are 0, 4 and 13. The distribution is
 - (a) Symmetrical
 - (b) Skewed to the left
 - (c) Skewed to the right
 - (d) None of the above
- (2) An average monthly production of a certain factory for the first 9 months is 2584 units and for the remaining 3 months it is 2416 units then average monthly production is
 - (a) 900
 - (b) 1250
 - (c) 2542
 - (d) 4000
- (3) If the harmonic mean of two numbers 60 and X is 48, then what is the value of X?
 - (a) 32
 - (b) 36
 - (c) 44
 - (d) 40
- (4) If $n = 10$, $\sum(X_i - 7) = 84$, $\sum(X_i - 7)^2 = 945$, then standard deviation = _____
 - (a) 94.5
 - (b) 9.84
 - (c) 4.89
 - (d) 8.94
- (5) A distribution with a coefficient of kurtosis less than 3 is known as
 - (a) Platykurtic
 - (b) Mesokurtic
 - (c) Leptokurtic
 - (d) None of the above

Q.2 (a) The arithmetic mean and geometric mean of two numbers are 127.5 and 60 respectively. Find (i) the two numbers (ii) the harmonic mean (iii) State and prove the result you had used to find the harmonic mean.

- (b) Find the mean, median and standard deviation of first n natural numbers. What will be the mean, median and standard deviation of first 100 natural numbers?

OR

Q.2 (a) Prove that the geometric mean of n numbers in G.P is equal to the geometric mean of its first and last term.

- (b) The following table gives the distribution of daily expenditure (in Rs.) of 500 workers in a factory.

Daily expenditure	50 - 100	100 - 150	150 - 200	200 - 250	250 - 300	300 - 350
No. of workers	10	25	145	220	70	30

Determine (i) median wage (ii) the limits for the daily expenditure of middle 65% of the workers (iii) % of workers who earned between 112 to 245 (iv) Inter Quartile Range

Q.3 (a) If $\bar{X}_i$ and Si^2 , $i = 1, 2, \dots, k$ be the means and variances of k groups each with n_i , $i = 1, 2, \dots, k$ observations respectively. Derive the formula for combined variance.

(b) The amount of lactic acid in the blood was examined for 10 men, before and after strenuous exercise, with the results in the following table:

Before	15	16	17	13	20	13	16	14	18	13
After	33	20	40	30	37	18	26	21	19	35

Compare the amount of lactic acid in the blood using Box – and – whisker plots.

OR

Q.3 (a) Find the mean deviation about mean of the series

$a, a + d, a + 2d, a + 3d, \dots, a + 2nd$

(b) The following table gives the distribution of daily income (in Rs.) of 500 workers in a factory. Calculate an appropriate measure of skewness and comment about the shape of the distribution.

Daily income	50 - 100	100 - 150	150 - 200	200 - 250	250 - 300	300 - 350
No. of workers	10	25	145	220	70	30

