

Chapter-14

Measures of Central Tendency and Dispersion

MTP March '20

1. For open-end classification, which of the following is the best measure of central tendency?
[MTP Oct. '19, March '19]
(a) AM (b) GM (c) Median (d) Mode
2. In case of an even number of observations which of the following is median?
(a) Any of the two middle-most value
(b) The simple average of these two middle values
(c) The weighted average of these two middle values
(d) Any of these
3. For a moderately skewed distribution, which of the following relationship holds?
[MTP March '19, April '19]
(a) Mean - Mode = 3 (Mean - Median) (b) Median - Mode = 3 (Mean - Median)
(c) Mean - Median = 3 (Mean - Mode) (d) Mean - Median = 3 (Median - Mode)
4. Two variables x and y are given by $y = 2x - 3$. If the median of x is 20, what is the median of y ?
[MTP Oct. '19]
(a) 20 (b) 40 (c) 37 (d) 35
5. If the relationship between two variables u and v are given by $2u + v + 7 = 0$ and if the AM of u is 10, then the AM of v is
(a) 17 (b) -17 (c) -27 (d) 27
6. The appropriate measure of dispersion for open-end classification is
(a) Standard deviation (b) Mean deviation
(c) Quartile deviation (d) All these measures
7. If R_x and R_y denote ranges of x and y respectively where x and y are related by $3x + 2y + 10 = 0$, what would be the relation between x and y ?
(a) $R_x = R_y$ (b) $2 R_x = 3 R_y$ (c) $3 R_x = 2 R_y$ (d) $R_x = 2 R_y$
8. If x and y are related by $2x + 3y + 4 = 0$ and SD of x is 9, then SD of y is
[MTP April '19]
(a) 22 (b) 6 (c) 5 (d) 24
9. The quartiles of a variable are 45, 52 and 75 respectively. Its quartile deviation is
(a) 15 (b) 20 (c) 25 (d) 8.30
10. If x and y are related as $3x + 4y = 20$ and the quartile deviation of x is 16, then the quartile deviation of y is
(a) 16 (b) 14 (c) 10 (d) 12

11. If x and y are related by $y = 2x + 5$ and the SD and AM of x are known to be 5 and 10 respectively, then the coefficient of variation of y is
 (a) 25 (b) 30 (c) 40 (d) 20
- MTP October '19**
12. The mean of the values of 1, 2, 3, ..., n with respective frequencies $x, 2x, 3x, \dots, nx$ is
 (a) $\frac{n+1}{2}$ (b) $\frac{n}{2}$ (c) $\frac{2n+1}{3}$ (d) $\frac{2n+1}{6}$
13. The mean of four observations is 10 and when a constant a is added to each observation, the mean becomes 13. The value of a is
 (a) 2 (b) -3 (c) 3 (d) None of these
14. A person travels from A to B at the rate of 20 km/hr and from B to A at the rate of 30 km/hr. What is the average rate of whole journey?
 (a) 30 km/hr. (b) 24 km/hr. (c) 35 km/hr. (d) none of these
[MTP March '21]
15. The average salary of a group of unskilled workers is Rs.10,000 and that of a group of skilled workers is Rs.15,000. If the combined salary is Rs.12,000, then what is the percentage of skilled workers?
 (a) 40% (b) 50% (c) 60% (d) none of these
[MTP April '19]
16. The third decile for the numbers 15, 10, 20, 25, 18, 11, 9, 12 is
 (a) 13 (b) 10.70 (c) 11 (d) 11.50
17. If the SD of x is 3, what is the variance of $(5-2x)$?
 (a) 36 (b) 6 (c) 1 (d) 9
18. If the values of all observations are equal then the Standard Deviation of the given observations is
 (a) 0 (b) 2 (c) 1 (d) None of these
19. The Standard Deviation of a set of 50 items is 10. Find the Standard Deviation if every item is increased by 5.
 (a) 15 (b) 5 (c) 10 (d) None of these
20. Find the coefficient of variation if the sum of squared deviations taken from mean 40 of 10 observations is 360.
 (a) 15 (b) 20 (c) 40 (d) None of these
21. The average of n numbers is x . If each of the numbers is multiplied by $(n+1)$; then the average of new set of numbers is
 (a) x (b) $\frac{x}{n+1}$ (c) $(n+1).x$ (d) None of these
22. The average weight of 8 person increases by 1.5 kg, if a person weighing 65 kg replaced by a new person, what would be the weight of the new person?
 (a) 76 kg (b) 80 kg (c) 77 kg (d) None of these
23. The presence of extreme observations does not affect
 (a) AM (b) Median (c) Mode (d) Any of these.
[MTP March '19, April '19]

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24. Which of the following results hold for a set of distinct positive observations?
(a) $AM = GM = HM$ (b) $HM = GM = AM$
(c) $AM > GM > HM$ (d) $GM > AM > HM$
25. Quartiles are the values dividing a given set of observations into
(a) Two equal parts (b) Four equal parts
(c) Five equal parts (d) None of these
26. If x and y are related by $x - y - 10 = 0$ and mode of x is known to be 23, then the mode of y is
(a) 20 (b) 13 (c) 3 (d) 23
27. What is the value of the first quartile for observations 15, 18, 10, 20, 23, 28, 12, 16?
(a) 17 (b) 16 (c) 12.75 (d) 12
28. If the relationship between two variables u and v are given by $2u + v + 7 = 0$ and if the AM of u is 10, then the AM of v is
(a) 17 (b) -17 (c) -27 (d) 27

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29. Quartiles can be determined graphically using
(a) Histogram (b) Frequency Polygon (c) Ogive (d) Pie chart
30. If there are 3 observations 15, 20, 25 then the sum of deviation of the observations from their AM is
(a) 0 (b) 5 (c) -5 (d) None of these.
31. Which measures of dispersions is not affected by the presence of extreme observations?
(a) Range (b) Mean deviation
(c) Standard deviation (d) Quartile deviation
32. Which measure is based on only the central fifty percent of the observations?
(a) Standard deviation (b) Quartile deviation
(c) Mean deviation (d) All these measures
33. If the profits of a company remain the same for the last ten months, then the standard deviation of profits for these ten months would be?
(a) Positive (b) Negative (c) Zero (d) (a) or (c)
34. The range of 15, 12, 10, 9, 17, 30 is
(a) 5 (b) 12 (c) 13 (d) 21
35. If the range of x is 2, what would be the range of $-3x + 50$?
(a) 2 (b) 6 (c) -6 (d) 44

36. If x and y are related by $2x+3y+4=0$ and SD of x is 6, then SD of y is
 (a) 22 (b) 4 (c) 40 (d) 9

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37. Which one is an absolute measure of dispersion?
 (a) Range (b) Mean Deviation (c) Standard Deviation
 (d) All these measures
38. The range of 15, 12, 10, 9, 17, 20 is
 (a) 5 (b) 12 (c) 13 (d) 11
39. The standard deviation of, 10, 16, 10, 16, 10, 10, 16, 16 is
 (a) 4 (b) 6 (c) 3 (d) 0
40. If all the observations are multiplied by 2, then
 (a) New SD would be also multiplied by 2 (b) New SD would be half of the previous SD
 (c) New SD would be increased by 2 (d) New SD would be decreased by 2.
41. The quartiles of a variable are 45, 52 and 65 respectively. Its quartile deviation is
 (a) 10 (b) 20 (c) 25 (d) 8.30

[MTP Oct '20]

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42. Two variables assume the values 1, 2, 3, ... 5 with frequencies as 1, 2, 3, ... 5, then what is the AM?
 (a) $11/3$ (b) $15/8$ (c) 4.86 (d) 10
43. If there are two groups with 75 and 65 as harmonic means containing 15 and 13 observation then combined HM is given by
 (a) 70 (b) 72.25 (c) 78 (d) 76
44. Quartile can be determined graphically using
 (a) ogive (b) Histogram (c) Pie Chart (d) Frequency Polygon
45. The mean deviation about Mode for the numbers $4/11, 6/11, 8/11, 9/11, 12/11, 8/11$ is
 (a) $9/15$ (b) 12 (c) $6/11$ (d) $1/6$
46. The range of 28, 22, 40, 20, 15, 50 is
 (a) 40 (b) 22 (c) 35 (d) none
47. A shift of origin has no impact on
 (a) Mean Deviation (b) Standard Deviation
 (c) Quartile Deviation (d) All of these
48. What is the coefficient of variation of the following numbers 53, 52, 61, 60, 64
 (a) 18.09 (b) 8.09 (c) 12.23 (d) 15.45
49. The mean and SD for a, b , and 2 are 3 and 1 respectively, the value of ab would be
 (a) 3 (b) 11.5 (c) 12 (d) 13
50. If the relation between x and y is $5y - 3x = 10$ and the mean deviation about mean for x is 12, then the mean deviation of y about mean is
 (a) 9.20 (b) 6.80 (c) 7.20 (d) 15.80
51. Which measure of dispersion is based on all the observations
 (a) Standard Deviation (b) Mean Deviation
 (c) Quartile Deviation (d) Both (a) and (b)

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The sum of the squares of deviations of a set of observations has the smallest value, when the deviations are taken from their:

- (a) A.M. (b) H.M. (c) G.M. (d) None

If two variables x and y are related by $2x + 3y - 7 = 0$ and the mean and mean deviation about mean of x are 1 and 0.3 respectively, then the co-efficient of mean deviation of y about mean is:

- (a) -5 (b) 4 (c) 12 (d) 50

If the A.M. and H.M. for two numbers are 5 and 3.2 respectively then the G.M. will be:

- (a) 4.05 (b) 16 (c) 4 (d) 4.10

What is the coefficient of range for the following distribution?

Class interval	10-19	20-29	30-39	40-49	50-59
Frequency	11	25	16	7	3
(a) 22	(b) 50	(c) 75.82	(d) 72.46		

G.M is a better measure than others when,

- (a) ratios and percentages are given (b) interval of scale is given
(c) Both (a) and (b) (d) Either (a) or (b)

The sum of squares of deviation from mean of 10 observations is 250. Mean of the data is 10. Find the coefficient of variation.

- (a) 10% (b) 25% (c) 50% (d) 0%

The equation of a line is $5x + 2y = 17$. Mean deviation of y about mean is 5. Calculate mean deviation of x about mean.

- (a) -2 (b) 2 (c) -4 (d) None

If variance of x is 5, then find the variance of $(2 - 3x)$

- (a) 10 (b) 45 (c) 5 (d) -13

Let the mean of the variable ' x ' be 50, then the mean of $u = 10 + 5x$ will be:

- (a) 250 (b) 260 (c) 265 (d) 273

If sum of squares of the values = 3390, $N = 30$ and standard deviation = 7, find out the mean.

- (a) 113 (b) 210 (c) 8 (d) None of these

Which of the following measures of central tendency cannot be calculated by graphical method?

- (a) Mean (b) Mode (c) Median (d) Quartile

MTP-March'22

For open-end classification, which of the following is the best measure of central tendency?

- (a) AM (b) GM (c) Median (d) Mode

The quartiles of a variable are 45, 52 and 65 respectively. Its quartile deviation is

- (a) 10 (b) 20 (c) 25 (d) 8.30

For a moderately skewewd distribution, the median is twice the mean, then the mode is _____ times the median.

- (a) 3 (b) 2 (c) $\frac{2}{3}$ (d) $\frac{3}{2}$
66. If average marks for a group of 30 girls is 80, average for a group of boys is 70 and combined average is 76, then how many boys are in the group? (a) 21 (b) 20 (c) 22 (d) 19
67. The median value of the set of observations 48, 36, 72, 87, 19, 66, 56 and 91 (a) 53 (b) 87 (c) 61 (d) 19
68. If two variables a and b are related by $c = ab$ then GM. of c = (a) GM of a + GM of b (b) GM of a \times GM of b (c) GM of a - GM of b (d) GM of a / GM of b
69. The mean weight of 15 students is 110 kg. The mean weight of 5 of them is 100 kg. and of another five students is 125 kg. then the mean weight of the remaining students is : (a) 120 (b) 105 (c) 115 (d) None of these
70. If the Arithmetic mean between two numbers is 64 and the Geometric mean between them is 16. The Harmonic Mean between them is _____. (a) 64 (b) 4 (c) 16 (d) 40
71. If $2x + 3y + 4 = 0$ and $V(x) = 6$ then $V(y)$ is (a) $8\sqrt{3}$ (b) 9 (c) 9 (d) 6
72. The absolute deviation are minimum when taken from (a) Mean (b) Median (c) Mode (d) GM
73. If x and y are related as $3x - 4y = 20$ then the Quartile deviation of x is 12, then the Quartile deviation of y is : (a) 14 (b) 15 (c) 16 (d) 9

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74. If x and y are related by $x - y - 10 = 0$ and mode of x is known to be 23, then the mode of y is (a) 20 (b) 13 (c) 3 (d) 23
75. If the quartile deviation of x is 6 and $3x + 6y = 20$, what is the quartile deviation of y? (a) 3 (b) 4 (c) 5 (d) 6
76. The median of 27, 30, 26, 44, 42, 51, 37 is (a) 30 (b) 42 (c) 44 (d) 37
77. Mean of 25, 32, 43, 53, 62, 59, 48, 31, 24, 33 is (a) 44 (b) 43 (c) 42 (d) 41
78. If the A.M of any distribution be 25 & one term is 18. Then the deviation of 18 from A.M is (a) 7 (b) -7 (c) 43 (d) none
79. The algebraic sum of the deviations of a frequency distribution from its mean is always, (a) greater than zero (b) less than zero (c) zero (d) a non-zero number

pooled Mean is also called

- (a) Mean (b) Geometric Mean (c) Grouped Mean (d) none

MTP-Nov'21

Which of the following is not a criteria for ideal measure of central tendency?

- (a) It should be ambiguously defined
(b) It should be simple to compute
(c) It should be based on all the observations
(d) None of these

At ABC Ltd, the average age of employees is 36. Average age of male employees is 38 and that of females is 32. Find the ratio of female to male in the company.

- (a) 1:3 (b) 2:1 (c) 1:2 (d) 3:1

The mean height of girls in class is 162cm while for boys is 182cm. The ratio of number of girls: boys is 1:2. Find the mean height of the whole class

- (a) 170 cm (b) 180 cm (c) 154 cm (d) None

In the equation $4x+2y=3$, quartile deviation for y is 3. Find the quartile deviation for x .

- (a) 4.5 (b) 6 (c) 1.5 (d) None

The Standard deviation is independent of change of

- (a) Scale (b) Origin (c) Both (a) and (b) (d) None

Find D6 for the following observations. 7, 9, 5, 4, 10, 15, 14, 18, 6, 20

- (a) 11.40 (b) 12.40 (c) 13.40 (d) 13.80

If all the observations are decreased by 4, find the relation between new SD and old SD.

- (a) New SD = Old SD/2 (b) New SD = Old SD - 2
(c) New SD = Old SD - 4 (d) Remains unchanged

Standard deviation of first n natural number is 2. What is the value of n ?

- (a) 7 (b) 6 (c) 5 (d) 8

Find the variance of $3x+2$ if standard deviation of x is 4

- (a) 9 (b) 160 (c) 16 (d) 144

if the variance of $x = 148.6$ and mean of $x = 40$, then the coefficient of variation is

- (a) 37.15 (b) 30.48 (c) 33.75 (d) None

The average of 10 observations is 14.4. If the average of first four observations is 16.5. The average of remaining 6 observations is :

- (a) 13.6 (b) 13.0 (c) 13.2 (d) 12.5

If the rates return from three different shares are 100%, 200% and 400% respectively. The average rate of return will be.

- (a) 350% (b) 233.33% (c) 200% (d) 300%

For a 4×7 classification of bivariate data, the maximum number of conditional distributions is :

- (a) 11 (b) 28 (c) 35 (d) None

94. Find the two numbers if AM and GM is 10 and 6 respectively (d) 18, 2
 (a) 6, 6 (b) 12, 8 (c) 9, 4

MTP-2 Nov'22

95. The AM of 15 observations is 9 and the AM of first 9 observations is 11 and then AM of remaining observations is: (d) 9
 (a) 11 (b) 6 (c) 5
96. In a moderately skewed distribution the values of mean and median are 12 and 8 respectively. The value of mode is: (d) 30
 (a) 0 (b) 12 (c) 15
97. Which of the following is positional average? (d) AM
 (a) Median (b) GM (c) HM
98. For a symmetric distribution: (b) Mode = 3 Median - 2 Mean
 (a) Mean = Median = Mode (d) None
 (c) Mode = $\frac{1}{3}$ Median = $\frac{1}{2}$ Mean
99. For the distribution

x	f
1	6
2	9
3	10
4	14
5	12
6	8

The value of median is:

- (a) 3.5 (b) 3 (c) 4 (d) 5
100. The QD of six numbers 15, 8, 36, 40, 38, 41 is equal to: $Q_1 = 13.25$ $Q_3 = 40 + 0.25(41 - 40) = 40.25$
 (a) 12.5 (b) 25 (c) 13.5 (d) 37
101. SD of first five consecutive natural numbers is: $\frac{8 + 0.75(5 - 1)}{2} = 2.5$
 (a) $\sqrt{10}$ (b) $\sqrt{8}$ (c) $\sqrt{3}$ (d) $\sqrt{2}$
102. If the profit of a company remain same for the last 10 months then the SD of profit of the company would be:
 (a) Positive (b) Negative (c) Zero (d) either (a) or (c)
103. Coefficient of Quartile Deviation is $\frac{1}{4}$ then $Q_3/Q_1 = ?$ (d) either (a) or (c)
 (a) $\frac{5}{3}$ (b) $\frac{4}{3}$ (c) $\frac{3}{4}$
104. The sum of mean and SD of a series is $a + b$, if we add 2 to each observation of the series then the sum of mean and SD is: (d) $\frac{3}{5}$
 (a) $a + b + 2$ (b) $6 - a + b$ (c) $4 + a - b$ (d) $a + b + 4$

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105. In a group of persons, average weight is 60 kg. If the average of males and females taken separately is 80 kg and 50 kg respectively, find the ratio of the number of males to that of females.
 (a) 2:3 (b) 3:2 (c) 2:1 (d) 1:2
106. A train covered the first 5 km of its journey at a speed of 30km/hr and next 15 km at a speed of 45 km/hr. The average speed of the train was :
 (a) 38 km/hr (b) 40 km/hr (c) 36 km/hr (d) 42 km/hr
107. If the standard deviation of 1, 2, 3, 4, 10 is σ , then the standard deviation of 11, 12, 13, 14, 20 is:
 (a) 10σ (b) $10+\sigma$ (c) σ (d) None of these
108. What is the standard deviation of the following series :

Measurements	0-10	10-20	20-30	30-40
Frequency :	1	3	4	2

 (a) 81 (b) 7.6 (c) 9 (d) 2.26
109. If the difference between Mean and Mode is 69, then the difference between Mean and Median will be _____:
 (a) 63 (b) 31.5 (c) 23 (d) None of these
69 = 3(x - M)
110. If all observations in a distribution are increased by 6, then the variance of the series will be unchanged.
 (a) Increased (b) Decreased (c) Unchanged (d) None of these.
111. Which measure of dispersion is base on the absolute deviation only?
 (a) Range (b) Standard Deviation (c) Mean Deviation (d) Quartile Deviation
112. Calculaue the value of 3rd quartile from the following data 40, 35, 51, 30, 21, 25, 16, 29, 27, 32
 (a) 36.25 (b) 30.25 (c) 25 (d) 35
9 8 10 6 2 3 5 4 7
35 + 0.25(40 - 35)
113. The mean of 100 students was 45 . Later on, it was discovered that the marks of two students were misread as 85 and 54 instead of 58 and 45. Find correct mean.
 (a) 68 (b) 36 (c) 44.64 (d) 52
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114. The arithmetic maen and coeffienct of variation of data set x are respectively, 10 and 30. The variance of $30-2x$ is
 (a) 28 (b) 32 (c) 34 (d) 36
115. The approximate ratio of SD, MD, QD is
 (a) 2:3:4 (b) 3:4:5 (c) 15:12:10 (d) 5:6:7
116. The geometric mean of three numbers 40, 50 and x is 10, the value of x is
 (a) 5 (b) 4 (c) 2 (d) $\frac{1}{2}$
10 = $\sqrt[3]{40 \times 50 \times x}$

MTP-2 June'22

117. The quartile deviation from the following observations is 10, 18, 20, 28, 15, 17, 22, 25, 29, 32, 34 is equal to:
 (a) 8 (b) 6 (c) 10 (d) 5
1 4 5 8 2 3 6 7 9 10 11
118. Variance of first five consecutive natural numbers is:
 (a) 10 (b) 8 (c) 3 (d) 2

119. If the profit of a company remains same for the last 10 months then the SD of profit of the company would be:
 (a) Positive (b) Negative (c) Zero (d) either (a) or (c)
120. A batsman in his 12th innings makes a score of 120 and thereby increases his average by 5. What is his average after 12th innings?
 (a) 60 (b) 55 (c) 65 (d) 70
121. The sum of squares of the deviations of the given values from their is minimum.
 (a) Arithmetic Mean (b) Median (c) Mode (d) None of these
122. When mean is 3.57 and mode is 2.13 then the value of median is
 (a) 3.09 $2 = 3.14 - 2.58$ (b) 5.01 (c) 4.01 (d) None of these
123. The mean of first three terms is 14 and mean of next two terms is 18. The mean of all five terms is
 (a) 14.5 (b) 15 (c) 14 (d) 15.6
124. The Standard deviation of a variable x is to be 10. The Standard deviation of $50+5x$ is
 (a) 50 (b) 100 (c) 10 (d) 500
125. The Quartile deviation is $QD = 2/3 SD$ $QD = 2/3 \sigma$
 (a) $2/3$ of SD (b) $4/5$ of SD (c) $5/6$ of SD (d) None of these
126. The first Quartile is 142 and Semi-Inter Quartile Range is 18, then the value of Median is:
 (a) 151 (b) 160 106 (c) 178 (d) None of these
127. Geometric Mean of 8, 4, 2 is
 (a) 4 (b) 2 (c) 8 (d) none of these
128. If the difference between mean and mode is 33, then the difference between Mean and Median will be _____
 (a) 63 (b) 31.5 (c) 11 (d) None of the above

ANSWER KEYS

1	(c)	2	(b)	3	(a)	4	(c)
5	(c)	6	(c)	7	(c)	8	(b)
9	(a)	10	(d)	11	(c)	12	(c)
13	(c)	14	(b)	15	(a)	16	(b)
17	(a)	18	(a)	19	(c)	20	(a)
21	(c)	22	(c)	23	(b)	24	(c)
25	(b)	26	(b)	27	(c)	28	(c)
29	(c)	30	(a)	31	(d)	32	(b)
33	(c)	34	(d)	35	(b)	36	(b)

37	(d)	38	(d)	39	(c)	40	(a)
41	(a)	42	(a)	43	(a)	44	(a)
45	(d)	46	(c)	47	(d)	48	(b)
49	(b)	50	(c)	51	(d)	52	(a)
53	(c)	54	(c)	55	(d)	56	(a)
57	(c)	58	(b)	59	(b)	60	(b)
61	(c)	62	(a)	63	(c)	64	(a)
65	(b)	66	(b)	67	(c)	68	(b)
69	(b)	70	(b)	71	(a)	72	(b)
73	(d)	74	(b)	75	(a)	76	(d)
77	(d)	78	(b)	79	(c)	80	(c)
81	(a)	82	(c)	83	(d)	84	(c)
85	(b)	86	(b)	87	(d)	88	(a)
89	(d)	90	(b)	91	(b)	92	(c)
93	(a)	94	(d)	95	(b)	96	(a)
97	(a)	98	(a)	99	(c)	100	(c)
101	(d)	102	(c)	103	(a)	104	(a)
105	(d)	106	(b)			107	(c)
108	(c)	109	(c)	110	(c)	111	(c)
112	(a)	113	(c)	114	(d)	115	(c)
116	(d)	117	(b)	118	(d)	119	(c)
120	(c)	121	(a)	122	(a)	123	(d)
124	(a)	125	(a)	126	(b)	127	(a)
128	(c)						