

93. Consider the following statements: [2012-II]
 1. Two independent variables are always uncorrelated.
 2. The coefficient of correlation between two variables X and Y is positive when X decreases then Y decreases.
 Which of the above statements is/are correct?
 (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2
94. A variate X takes values 2, 9, 3, 7, 5, 4, 3, 2, 10. What is the median? [2012-II]
 (a) 2 (b) 4 (c) 7 (d) 9
95. The mean of 10 observations is 5. If 2 is added to each observation and then multiplied by 3, then what will be the new mean? [2012-II]
 (a) 5 (b) 7 (c) 15 (d) 21
96. What is the mean of first n odd natural numbers? [2012-II]
 (a) n (b) $\frac{(n+1)}{2}$
 (c) $\frac{n(n+1)}{2}$ (d) $n+1$
97. The arithmetic mean of numbers a, b, c, d, e is M . What is the value of $(a-M) + (b-M) + (c-M) + (d-M) + (e-M)$? [2012-II]
 (a) M (b) $a+b+c+d+e$
 (c) 0 (d) $5M$
98. The algebraic sum of the deviations of 20 observations measured from 30 is 2. What would be the mean of the observations? [2012-II]
 (a) 30 (b) 32 (c) 30.2 (d) 30.1
99. The median of 27 observations of a variable is 18. Three more observations are made and the values of these observations are 16, 18 and 50. What is the median of these 30 observations? [2012-II]
 (a) 18 (b) 19 (c) 25.5
 (d) Can not be determined due to insufficient data
100. Frequency curve may be: [2012-II]
 (a) symmetrical (b) positive skew
 (c) negative skew (d) all the above
101. The monthly family expenditure (in percentage) on different items are as follows: [2012-II]
- | Food | Rent | Cloth | Transport | Education | Others |
|------|------|-------|-----------|-----------|--------|
| 38 | 19 | 18 | - | 9 | 6 |
- If the total monthly expenditure is ₹ 9000, then what is the expenditure on transport?
 (a) ₹ 180 (b) ₹ 1000 (c) ₹ 900 (d) ₹ 360
102. If the mean of few observations is 40 and standard deviation is 8, then what is the coefficient of variation? [2012-II]
 (a) 1% (b) 10% (c) 20% (d) 30%
103. What is the standard deviation of 7, 9, 11, 13, 15? [2012-II]
 (a) 2.4 (b) 2.5 (c) 2.7 (d) 2.8
104. Which one of the following is a measure of dispersion?
 (a) Mean (b) Median [2012-II]
 (c) Mode (d) Standard deviation
105. Let X and Y be two related variables. The two regression lines are given by $x - y + 1 = 0$ and $2x - y + 4 = 0$. The two regression lines pass through the point: [2012-II]
 (a) (-4, -3) (b) (-6, -5)
 (c) (3, -2) (d) (-3, -2)
106. The marks obtained by 13 students in a test are 10, 3, 10, 12, 9, 7, 9, 6, 7, 10, 8, 6, 7. The median of this data is? [2013-I]
 (a) 7 (b) 8 (c) 9 (d) 10
107. Consider the following statements: [2013-I]
 1. Both variance and standard deviation are measures of variability in the population.
 2. Standard deviation is the square of the variance.
 Which of the above statements is/are correct?
 (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2
108. Consider the following frequency distribution:
- | Class interval | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
|----------------|------|-------|-------|-------|-------|
| Frequency | 14 | x | 27 | y | 15 |
- If the total of the frequencies is 100 and mode is 25, then which one of the following is correct? [2013-I]
 (a) $x = 2y$ (b) $2x = y$ (c) $x = y$ (d) $x = 3y$
109. The average marks obtained by the students in a class are 43. If the average marks obtained by 25 boys are 40 and the average marks obtained by the girl students are 48, then what is the number of girl students in the class? [2013-I]
 (a) 15 (b) 17 (c) 18 (d) 20
110. Marks obtained by 7 students in a subject are 30, 55, 75, 90, 50, 60, 39. The number of students securing marks less than the mean marks is. [2013-I]
 (a) 7 (b) 6 (c) 5 (d) 4
111. Variance is always independent of the change of [2013-I]
 (a) origin but not scale (b) scale only
 (c) both origin and scale (d) None of the above
112. If two lines of regression are perpendicular, then the correlation coefficient r is [2013-I]
 (a) 2 (b) $\frac{1}{2}$
 (c) 0 (d) None of the above
113. The standard deviation of the observations 5, 5, 5, 5, 5 is [2013-I]
 (a) 0 (b) 5 (c) 20 (d) 25
114. The mean of 20 observations is 15. On checking, it was found that two observations were wrongly copied as 3 and 6. If wrong observations are replaced by correct values 8 and 4, then the correct mean is [2013-II]
 (a) 15 (b) 15.15 (c) 15.35 (d) 16
115. The arithmetic mean of the squares of the first n natural numbers is [2013-II]
 (a) $\frac{n(n+1)(2n+1)}{6}$ (b) $\frac{n(n+1)(2n+1)}{2}$
 (c) $\frac{(n+1)(2n+1)}{6}$ (d) $\frac{(n+1)(2n+1)}{3}$

116. Consider the following statements : [2013-II]

1. Both the regression coefficients have same sign.
2. If one of the regression coefficients is greater than unity, the other must be less than unity.

Which of the above statements is/are correct ?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

117. Which one of the following measures is determined only after the construction of cumulative frequency distribution? [2013-II]

- (a) Arithmetic mean
- (b) Mode
- (c) Median
- (d) Geometric mean

118. Coefficient of correlation is the measure of [2013-II]

- (a) central tendency
- (b) dispersion
- (c) both central tendency and dispersion
- (d) neither central tendency nor dispersion

119. What is the variance of the first 11 natural numbers ? [2013-II]

- (a) 10
- (b) 11
- (c) 12
- (d) 13

120. Consider the following statements : [2013-II]

1. The algebraic sum of the deviations of a set of n values from its arithmetic mean is zero.
 2. In the case of frequency distribution, mode is the value of variable which corresponds to maximum frequency.
- Which of the statements above given is/are correct ?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

121. Consider the following statements : [2013-II]

1. Pie diagrams are suitable for categorical data.
2. The arc length of a sector of a pie diagram is proportional to the value of the component represented by the sector.

Which of the statements given above is/are correct ?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

122. The variance of 20 observations is 5. If each observation is multiplied by 2, then what is the new variance of the resulting observations ? [2013-II]

- (a) 5
- (b) 10
- (c) 20
- (d) 40

123. For two variables x and y , the two regression coefficients are $b_{yx} = -3/2$ and $b_{xy} = -1/6$. The correlation coefficient between x and y is : [2014-I]

- (a) $-1/4$
- (b) $1/4$
- (c) $-1/2$
- (d) $1/2$

124. The variance of numbers $x_1, x_2, x_3, \dots, x_n$ is V . Consider the following statements : [2014-I]

1. If every x_i is increased by 2, the variance of the new set of the new set of numbers is V .
2. If the numbers x_i is squared, the variance of the new set is V^2 .

Which of the following statements is/are correct ?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

125. What is the mean of the squares of the first 20 natural numbers ? [2014-I]

- (a) 151.5
- (b) 143.5
- (c) 65
- (d) 72

126. The cumulative frequency of the largest observed value must always be : [2014-I]

- (a) Less than the total number of observations
- (b) Greater than the total number of observations
- (c) Equal to total number of observations
- (d) Equal to mid point of the last class interval

127. Let X denote the number of scores which exceed 4 in 18, tosses of a symmetrical die. Consider the following statements : [2014-I]

1. The arithmetic mean of X is 6.
2. The standard deviation of X is 2.

Which of the above statements is/are correct ?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

DIRECTIONS: (Qs. 128 - 130) For the next three (03) items that follow :

Number of telephone calls received in 245 successive one minute intervals at an exchange is given below in the following frequency distribution. [2014-I]

Number of calls	0	1	2	3	4	5	6	7
Frequency	14	21	25	43	51	40	39	12

128. What is the mean of the distribution ?

- (a) 3.76
- (b) 3.84
- (c) 3.96
- (d) 4.05

129. What is the median of the distribution ?

- (a) 3.5
- (b) 4
- (c) 4.5
- (d) 5

130. What is the mode of the distribution ?

- (a) 3
- (b) 4
- (c) 5
- (d) 6

DIRECTIONS: (Qs. 131-133) For the next three (03) items that follow :

The mean and standard deviation of 100 items are 50, 5 and that of 150 items are 40, 6 respectively. [2014-I]

131. What is the combined mean of all 250 items ?

- (a) 43
- (b) 44
- (c) 45
- (d) 46

132. What is the combined standard deviation of all 250 items ?

- (a) 7.1
- (b) 7.3
- (c) 7.5
- (d) 7.7

133. What is the variance of all 250 items ?

- (a) 50.6
- (b) 53.3
- (c) 55.6
- (d) 59.6

134. Consider the following statements in respect of histogram: [2014-II]

1. The histogram is a suitable representation of a frequency distribution of a continuous variable.
2. The area included under the whole histogram is the total frequency.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

135. The regression lines will be perpendicular to each other if the coefficient of correlation r is equal to [2014-II]

- (a) 1 only
- (b) 1 or -1
- (c) -1 only
- (d) 0

136. If \bar{x} and \bar{y} are the means of two distributions such that $\bar{x} < \bar{y}$ and \bar{z} is the mean of the combined distribution, then which one of the following statements is correct ?

- (a) $\bar{x} < \bar{y} < \bar{z}$
- (b) $\bar{x} > \bar{y} > \bar{z}$

$$(c) \bar{z} = \frac{\bar{x} + \bar{y}}{2}$$

$$(d) \bar{x} < \bar{z} < \bar{y}$$

137. What is the mean deviation about the mean for the data 4, 7, 8, 9, 10, 12, 13, 17? [2014-II]
 (a) 2.5 (b) 3 (c) 3.5 (d) 4

138. The variance of 20 observations is 5. If each observation is multiplied by 2, then what is the new variance of the resulting observations? [2014-II]
 (a) 5 (b) 10 (c) 20 (d) 40

139. The mean and the variance of 10 observations are given to be 4 and 2 respectively. If every observation is multiplied by 2, the mean and the variance of the new series will be respectively [2015-I]
 (a) 8 and 20 (b) 8 and 4 (c) 8 and 8 (d) 80 and 40

140. Which one of the following measures of central tendency is used in construction of index numbers? [2015-II]
 (a) Harmonic mean (b) Geometric mean
 (c) Median (d) Mode

141. The correlation coefficient between two variables X and Y is found to be 0.6. All the observations on X and Y are transformed using the transformations $U = 2 - 3X$ and $V = 4Y + 1$. The correlation coefficient between the transformed variables U and V will be [2015-I]
 (a) -0.5 (b) +0.5 (c) -0.6 (d) +0.6

142. Which of the following statements is/are correct in respect of regression coefficients? [2015-I]

1. It measures the degree of linear relationship between two variables.
2. It gives the value by which one variable changes for a unit change in the other variable.

Select the correct answer using the code given below.

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

143. A set of annual numerical data, comparable over the years, is given for the last 12 years. [2015-I]

1. The data is best represented by a broken line graph, each corner (turning point) representing the data of one year.

2. Such a graph depicts the chronological change and also enables one to make a short-term forecast.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

144. The mean of five numbers is 30. If one number is excluded, their mean becomes 28. The excluded number is [2015-II]
 (a) 28 (b) 30 (c) 35 (d) 38

145. The 'less than' ogive curve and the 'more than' ogive curve intersect at [2015-II]

- (a) median (b) mode
 (c) arithmetic mean (d) None of these

146. The geometric mean of the observations $x_1, x_2, x_3, \dots, x_n$ is G_1 . The geometric mean of the observations $y_1, y_2, y_3, \dots, y_n$ is G_2 . The geometric mean of observations

$$\frac{x_1}{y_1}, \frac{x_2}{y_2}, \frac{x_3}{y_3}, \dots, \frac{x_n}{y_n} \text{ is } [2015-II]$$

- (a) $G_1 G_2$ (b) $\ln(G_1 G_2)$

$\frac{G_1}{G_2}$

$\ln\left(\frac{G_1}{G_2}\right)$

147. The arithmetic mean of 1, 8, 27, 64, ..., up to n terms is given by [2015-II]

(a) $\frac{n(n+1)}{2}$ (b) $\frac{n(n+1)^2}{2}$
 (c) $\frac{n(n+1)^2}{4}$ (d) $\frac{n^2(n+1)^2}{4}$

148. The regression coefficients of a bivariate distribution are -0.64 and -0.36. Then the correlation coefficient of the distribution is [2015-II]

- (a) 0.48 (b) -0.48 (c) 0.50 (d) -0.50
 149. What is the mean deviation from the mean of the numbers 10, 9, 21, 16, 24? [2016-I]

- (a) 5×2 (b) 5×0 (c) 4×5 (d) 4×0

150. If the total number of observations is 20, $\sum x_i = 1000$ and $\sum x_i^2 = 84000$, then what is the variance of the distribution? [2016-I]

- (a) 1500 (b) 1600 (c) 1700 (d) 1800

151. The mean of the series x_1, x_2, \dots, x_n is \bar{x} . If x_2 is replaced by λ , then what is the new mean? [2016-I]

(a) $\bar{x} - x_2 + \lambda$ (b) $\frac{\bar{x} - x_2 - \lambda}{n}$
 (c) $\frac{\bar{x} - x_2 + \lambda}{n}$ (d) $\frac{n\bar{x} - x_2 + \lambda}{n}$

152. For the data

- 3, 5, 1, 6, 5, 9, 5, 2, 8, 6 the mean, median and mode are x , y and z respectively. Which one of the following is correct? [2016-I]

- (a) $x = y = z$ (b) $x = y = z$
 (c) $x \neq y \neq z$ (d) $x = y = z$

153. Consider the following statements in respect of a histogram: [2016-I]

1. The total area of the rectangles in a histogram is equal to the total area bounded by the corresponding frequency polygon and the x -axis.

2. When class intervals are unequal in a frequency distribution, the area of the rectangle is proportional to the frequency.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

154. Consider the following statements: [2016-II]

1. The mean and median are equal in symmetric distribution.

2. The range is the difference between the maximum value and the minimum value in the data.

3. The sum of the areas of the rectangles in the histogram is equal to the total area bounded by the frequency polygon and the horizontal axis.

Which of the above statements are correct?

- (a) 1 and 2 only (b) 2 and 3 only
 (c) 1 and 3 only (d) 1, 2 and 3

155. The scores of 15 students in an examination were recorded as 10, 5, 8, 16, 18, 20, 8, 10, 16, 20, 18, 11, 16, 14 and 12. After calculating the mean, median and mode, an error is found. One of the values is wrongly written as 16 instead of 18. Which of the following measures of central tendency will change? [2016-II]

- (a) Mean and median (b) Median and mode
(c) Mode only (d) Mean and mode

156. For 10 observations on price (x) and supply (y), the following data was obtained: [2016-II]

$$\sum x = 130, \sum y = 220,$$

$$\sum x^2 = 2288, \sum y^2 = 5506 \text{ and } \sum xy = 3467.$$

What is line of regression of y on x ?

- (a) $y = 0.91x + 8.74$ (b) $y = 1.02x + 8.74$
(c) $y = 1.02x - 7.02$ (d) $y = 0.91x - 7.02$

157. In a study of two groups, the following results were obtained: [2016-II]

	Group A	Group B
Sample Size	20	25
Sample mean	22	23
Sample standard deviation	10	12

Which of the following statements is correct?

- (a) Group A is less variable than Group B because Group A's standard deviation is smaller.
(b) Group A is less variable than Group B because Group A's sample size is smaller.
(c) Group A is less variable than Group B because Group A's sample mean is smaller.
(d) Group A is less variable than group B because Group A's coefficient of variation is smaller.

158. Consider the following statements in respect of class intervals of grouped frequency distribution: [2016-II]

1. Class intervals need not be mutually exclusive.
2. Class intervals should be exhaustive.
3. Class intervals need not be of equal width.

Which of the above statements are correct?

- (a) Only 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) 1, 2 and 3

159. Two variates, x and y , are uncorrelated and have standard deviations σ_x and σ_y , respectively. What is the correlation coefficient between $x+y$ and $x-y$? [2016-II]

- (a) $\frac{\sigma_x \sigma_y}{\sigma_x^2 + \sigma_y^2}$ (b) $\frac{\sigma_x + \sigma_y}{2\sigma_x \sigma_y}$
(c) $\frac{\sigma_x^2 - \sigma_y^2}{\sigma_x^2 + \sigma_y^2}$ (d) $\frac{\sigma_y - \sigma_x}{\sigma_x \sigma_y}$

160. A random sample of 20 people is classified in the following table according to their ages: [2016-II]

Age	Frequency
15 – 25	2
25 – 35	4
35 – 45	6
45 – 55	5
55 – 65	3

What is the mean age of this group of people?

- (a) 41.0 (b) 41.5 (c) 42.0 (d) 42.5

161. If the covariance between x and y is 30, variance of x is 25 and variance of y is 144, then what is the correlation coefficient? [2016-II]

- (a) 0.4 (b) 0.5 (c) 0.6 (d) 0.7

162. The variance of 20 observations is 5. If each observation is multiplied by 3, then what is the new variance of the resulting observations? [2017-I]

- (a) 5 (b) 10 (c) 15 (d) 45

163. The mean of a group of 100 observations was found to be 20. Later it was found that four observations were incorrect, which were recorded as 21, 21, 18 and 20. What is the mean if the incorrect observations are omitted? [2017-I]

- (a) 18 (b) 20 (c) 21 (d) 22

164. If two regression lines between height (x) and weight (y) are $4y - 15x + 410 = 0$ and $30x - 2y - 825 = 0$, then what will be the correlation coefficient between height and weight? [2017-I]

- (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{3}{4}$

165. In an examination, 40% of candidates got second class. When the data are represented by a pie chart, what is the angle corresponding to second class? [2017-I]

- (a) 40° (b) 90° (c) 144° (d) 320°

166. Consider the following statements: [2017-I]
Statement 1 : Range is not a good measure of dispersion.
Statement 2 : Range is highly affected by the existence of extreme values.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement 1 and Statement 2 are correct and Statement 2 is the correct explanation of Statement 1
(b) Both Statement 1 and Statement 2 are correct but Statement 2 is not the correct explanation of Statement 1
(c) Statement 1 is correct but Statement 2 is not correct
(d) Statement 2 is correct but Statement 1 is not correct

167. If the data are moderately non-symmetrical, then which one of the following empirical relationships is correct? [2017-I]

- (a) $2 \times \text{Standard deviation} = 5 \times \text{Mean deviation}$
(b) $8 \times \text{Standard deviation} = 2 \times \text{Mean deviation}$
(c) $4 \times \text{Standard deviation} = 5 \times \text{Mean deviation}$
(d) $5 \times \text{Standard deviation} = 4 \times \text{Mean deviation}$

168. Data can be represented in which of the following forms?

1. Textual form 2. Tabular form
3. Graphical form

Select the correct answer using the code given below.

[2017-I]

- (a) 1 and 2 only (b) 1 and 3 only
 (c) 1 and 3 only (d) 1, 2 and 3
169. For given statistical data, the graphs for less than ogive and more than ogive are drawn. If the point at which the two curves intersect is P, then abscissa of point P gives the value of which one of the following measures of central tendency? [2017-I]
 (a) Median (b) Mean
 (c) Mode (d) Geometric mean

170. If the regression coefficient of x on y and y on x are $-\frac{1}{2}$

and $-\frac{1}{8}$ respectively, then what is the correlation coefficient between x and y ? [2017-I]

- (a) $-\frac{1}{4}$ (b) $-\frac{1}{16}$ (c) $\frac{1}{16}$ (d) $\frac{1}{4}$

171. A sample of 5 observations has mean 32 and median 33. Later it is found that an observation was recorded incorrectly as 40 instead of 35. If we correct the data, then which one of the following is correct? [2017-I]

- (a) The mean and median remain the same
 (b) The median remains the same but the mean will decrease
 (c) The mean and median both will decrease
 (d) The mean remains the same but median will decrease

172. Consider the following statements : [2017-II]

1. Coefficient of variation depends on the unit of measurement of the variable.
2. Range is a measure of dispersion.
3. Mean deviation is least when measured about median.

Which of the above statements are correct?

- (a) 1 and 2 only (b) 2 and 3 only
 (c) 1 and 3 only (d) 1, 2 and 3

173. Given that the arithmetic mean and standard deviation of a sample of 15 observations are 24 and 0 respectively. Then which one of the following is the arithmetic mean of the smallest five observations in the data? [2017-II]

- (a) 0 (b) 6
 (c) 16 (d) 24

174. Which one of the following can be considered as appropriate pair of values of regression coefficient of y on x and regression coefficient of x on y ? [2017-II]

- (a) (1, 1) (b) (-1, 1)
 (c) $\left(-\frac{1}{2}, 2\right)$ (d) $\left(\frac{1}{3}, \frac{10}{3}\right)$

175. It is given that $\bar{X} = 10$, $\bar{Y} = 90$, $\sigma_X = 3$, $\sigma_Y = 12$ and $r_{XY} = 0.8$. The regression equation of X on Y is [2017-II]

- (a) $Y = 3.2X + 58$ (b) $X = 3.2Y + 58$
 (c) $X = -8 + 0.2Y$ (d) $Y = -8 + 0.2X$

176. The following table gives the monthly expenditure of two families :

Items	Expenditure (in ₹)	
	Family A	Family B
Food	3,500	2,700
Clothing	500	800
Rent	1,500	1,000
Education	2,000	1,800
Miscellaneous	2,500	1,800

In constructing a pie diagram to the above data, the radii of the circles are to be chosen by which one of the following ratios? [2017-II]

- (a) 1:1 (b) 10:9 (c) 100:91 (d) 5:4

177. If a variable takes values 0, 1, 2, 3, ..., n with frequencies $1, C(n, 1), C(n, 2), C(n, 3), \dots, C(n, n)$ respectively, then the arithmetic mean is [2017-II]

- (a) $2n$ (b) $n+1$ (c) n (d) $\frac{n}{2}$

178. Consider the following statements : [2017-II]

1. Variance is unaffected by change of origin and change of scale.
2. Coefficient of variance is independent of the unit of observations.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

179. The coefficient of correlation when coefficients of regression are 0.2 and 1.8 is [2017-II]

- (a) 0.36 (b) 0.2 (c) 0.6 (d) 0.9

180. In a Binomial distribution, the mean is three times its variance. What is the probability of exactly 3 successes out of 5 trials? [2018-I]

- (a) $\frac{80}{243}$ (b) $\frac{40}{243}$ (c) $\frac{20}{243}$ (d) $\frac{10}{243}$

181. If the correlation coefficient between x and y is 0.6, covariance is 27 and variance of y is 25, then what is the variance of x ? [2018-I]

- (a) $\frac{9}{5}$ (b) $\frac{81}{25}$ (c) 9 (d) 81

182. Let \bar{x} be the mean of $x_1, x_2, x_3, \dots, x_n$. If $x_i = a + cy_i$ for some constants a and c , then what will be the mean of $y_1, y_2, y_3, \dots, y_n$? [2018-I]

- (a) $a + c\bar{x}$ (b) $a - \frac{1}{c}\bar{x}$ (c) $\frac{1}{c}\bar{x} - a$ (d) $\frac{\bar{x} - a}{c}$

183. Consider the following statements: [2018-I]

1. If the correlation coefficient $r_{xy} = 0$, then the two lines of regression are parallel to each other.
2. If the correlation coefficient $r_{xy} = +1$, then the two lines of regression are perpendicular to each other.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

184. If $4x - 5y + 33 = 0$ and $20x - 9y = 107$ are two lines of regression, then what are the values of \bar{x} and \bar{y} respectively? [2018-I]

- (a) 12 and 18 (b) 18 and 12
 (c) 13 and 17 (d) 17 and 13

185. Consider the following statements:
 1. Mean is independent of change in scale and change in origin. [2018-II]
 2. Variance is independent of change in scale but not in origin.
- Which of the above statements is/are correct?
 (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2
186. Consider the following statements: [2018-I]
 1. The sum of deviations from mean is always zero.
 2. The sum of absolute deviations is minimum when taken around median.
- Which of the above statements is/are correct?
 (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2
187. What is the median of the numbers 4.6, 0, 9.3, -4.8, 7.6, 2.3, 12.7, 3.5, 8.2, 6.1, 3.9, 5.2? [2018-I]
 (a) 3.8 (b) 4.9 (c) 5.7 (d) 6.0
188. In a test in Mathematics, 20% of the students obtained "first class". If the data are represented by a Pie-Chart, what is the central angle corresponding to "first class"? [2018-I]
 (a) 20° (b) 36° (c) 72° (d) 144°
189. The mean and standard deviation of a set of values are 5 and 2 respectively. If 5 is added to each value, then what is the coefficient of variation for the new set of values? [2018-I]
 (a) 10 (b) 20 (c) 40 (d) 70
190. The standard deviation σ of the first N natural numbers can be obtained using which one of the following formulae? [2018-I]
 (a) $\sigma = \frac{N^2 - 1}{12}$
 (b) $\sigma = \sqrt{\frac{N^2 - 1}{12}}$
 (c) $\sigma = \sqrt{\frac{N-1}{12}}$
 (d) $\sigma = \sqrt{\frac{N^2 - 1}{6N}}$
191. The average age of a combined group of men and women is 25 years. If the average age of the group of men is 26 years and the of the group of women is 21 years, then the percentage of men and women in the group is respectively [2018-II]
 (a) 20, 80 (b) 40, 60 (c) 60, 40 (d) 80, 20
192. The variance of 25 observations is 4. If 2 is added to each observation, then the new variance of the resulting observations is [2018-II]
 (a) 2 (b) 4 (c) 6 (d) 8
193. If the regression coefficient of Y on X is -6 , and the correlation coefficient between X and Y $-\frac{1}{2}$, then the regression coefficient of X on Y would be [2018-II]
 (a) $\frac{1}{24}$ (b) $-\frac{1}{24}$ (c) $-\frac{1}{6}$ (d) $\frac{1}{6}$
194. The set of bivariate observation $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$ are such that all the values are distinct and all the observations fall on a straight line with non-zero slope.
- Then the possible values of the correlation coefficient between x and y are [2018-II]
 (a) 0 and 1 only (b) 0 and -1 only
 (c) 0, 1 and -1 (d) -1 and 1 only
195. An analysis of monthly wages paid to the workers in two firms A and B belonging to the same industry the following result: [2018-II]
- | | Firm A | Firm B |
|-----------------------------------|--------|--------|
| Number of workers | 500 | 600 |
| Average monthly wage | ₹ 1860 | ₹ 1750 |
| Variance of distribution of wages | 81 | 100 |
- The average of monthly wages and variance of distribution of wages of all the workers in the firms A and B taken together are [2018-II]
 (a) ₹ 1860, 100 (b) ₹ 1750, 100
 (c) ₹ 1800, 81 (d) None of above
196. Which one of the following can be obtained from an ogive? [2018-II]
 (a) Mean (b) Median
 (c) Geometric mean (d) Mode
197. In any discrete series (when all values are not same) if x represents mean deviation about mean and y represents standard deviation, then which one of the following is correct? [2018-II]
 (a) $y \geq x$ (b) $y \leq x$ (c) $x = y$ (d) $x < y$
198. In which one of the following cases would you expect to get a negative correlation? [2018-II]
 (a) The ages of husbands and wives
 (b) Shoe size and intelligence
 (c) Insurance companies profits and the number of claims they have to pay
 (d) Amount of rainfall and yield of crop
199. The mean of 100 observations is 50 and the standard deviation is 10. If 5 is subtracted from each observation and then it is divided by 4, then what will be the new mean and the new standard deviation respectively? [2019-I]
 (a) 45.5 (b) 11.25, 1.25
 (c) 11.25, 2.5 (d) 12.5, 2.5
200. Consider the following statements : [2019-I]
 1. The algebraic sum of deviations of a set of values from their arithmetic mean is always zero.
 2. Arithmetic mean $>$ Median $>$ Mode for a symmetric distribution.
- Which of the above statements is/are correct ?
 (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2
201. Let the correlation coefficient between X and Y be 0.6. Random variables Z and W are defined as $Z = X + 5$ and

DIRECTIONS (Qs. 212-214): Read the following information and answer the three items that follow:

Marks	Number of students	
	Physics	Mathematics
10 - 20	8	10
20 - 30	11	21
30 - 40	30	38
40 - 50	26	15
50 - 60	15	10
60 - 70	10	6

- W = $\frac{Y}{3}$. What is the correlation coefficient between Z and W? [NDA 2019-II]
- (a) 0.1 (b) 0.2 (c) 0.36 (d) 0.6
202. If all the natural numbers between 1 and 20 are multiplied by 3, then what is the variance of the resulting series? [NDA 2019-II]
- (a) 99.75 (b) 199.75 (c) 299.25 (d) 399.25
203. The median of the observations 22, 24, 33, 37, $x+1$, $x+3$, 46, 47, 57, 58 in ascending order is 42. What are the values of 5th and 6th observations respectively? [NDA 2019-II]
- (a) 42, 45 (b) 41, 43 (c) 43, 46 (d) 40, 40
204. Arithmetic mean of 10 observations is 60 and sum of squares of deviations from 50 is 5000. What is the standard deviation of the observations? [NDA 2019-II]
- (a) 20 (b) 21 (c) 22.36 (d) 24.70
205. For the variables x and y, the two regression lines are $6x + y = 30$ and $3x + 2y = 25$. What are the values of \bar{x} , \bar{y} and r respectively? [NDA 2019-II]
- (a) $\frac{20}{3}, \frac{35}{9}, -0.5$ (b) $\frac{20}{3}, \frac{35}{9}, 0.5$
 (c) $\frac{35}{9}, \frac{20}{3}, -0.5$ (d) $\frac{35}{9}, \frac{20}{3}, 0.5$
206. The class marks in a frequency table are given to be 5, 10, 15, 20, 25, 30, 35, 40, 45, 50. The class limits of the first five classes are [NDA 2019-II]
- (a) 3-7, 7-13, 13-17, 17-23, 23-27
 (b) 2.5-7.5, 7.5-12.5, 12.5-17.5, 17.5-22.5, 22.5-27.5
 (c) 1.5-8.5, 8.5-11.5, 11.5-18.5, 18.5-21.5, 21.5-28.5
 (d) 2-8, 8-12, 12-18, 18-22, 22-28
207. The mean of 5 observations is 4.4 and variance is 8.24. If three of the five observations are 1, 2 and 6, then what are the other two observations? [NDA 2019-II]
- (a) 9, 16 (b) 9, 4 (c) 81, 16 (d) 81, 4
208. Consider the following discrete frequency distribution:
- | | | | | | | | | |
|---|---|----|----|----|----|----|----|---|
| x | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| f | 3 | 15 | 45 | 57 | 50 | 36 | 25 | 9 |
- What is the value of median of the distribution? [NDA 2019-II]
- (a) 4 (b) 5 (c) 6 (d) 7
209. Mean of 100 observations is 50 and standard deviation is 10. If 5 is added to each observation, then what will be the new mean and new standard deviation respectively? [NDA 2019-II]
- (a) 50, 10 (b) 50, 15 (c) 55, 10 (d) 55, 15
210. If the range of a set of observations on a variable X is known to be 25 and if $Y = 40 + 3X$, then what is the range of the set of corresponding observations on Y? [NDA 2019-II]
- (a) 25 (b) 40 (c) 75 (d) 115
211. If V is the variance and M is the mean of first 15 natural numbers, then what is $V + M^2$ equal to? [NDA 2019-II]
- (a) $\frac{124}{3}$ (b) $\frac{148}{3}$ (c) $\frac{248}{3}$ (d) $\frac{124}{9}$
212. The difference between number of students under Physics and Mathematics is largest for the interval [NDA 2020-II]
- (a) 20-30 (b) 30-40 (c) 40-50 (d) 50-60
213. Consider the following statements: [NDA 2020-II]
1. Modal value of the marks in Physics lies in the interval 30-40.
 2. Median of the marks in Physics is less than that of marks in Mathematics.
- Which of the above statements is/are correct?
- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2
214. What is the mean of marks in Physics? [NDA 2020-II]
- (a) 38.4 (b) 39.4 (c) 40.9 (d) 41.6
215. What is the standard deviation of the observations $-\sqrt{6}, -\sqrt{5}, -\sqrt{4}, -1, 1, \sqrt{4}, \sqrt{5}, \sqrt{6}$? [NDA 2020-II]
- (a) $\sqrt{2}$ (b) 2 (c) $2\sqrt{2}$ (d) 4
216. If $\sum x_i = 20$, $\sum x_i^2 = 200$ and $n = 10$ for an observed variable x , then what is the coefficient of variation? [NDA 2020-II]
- (a) 80 (b) 100 (c) 150 (d) 200
217. The arithmetic mean of 100 observations is 40. Later, it was found that an observation '53' was wrongly read as '83'. What is the correct arithmetic mean? [NDA 2020-II]
- (a) 39.8 (b) 39.7 (c) 39.6 (d) 39.5
218. Let X and Y represent prices (in ₹) of a commodity in Kolkata and Mumbai respectively. It is given that $X = 65$, $Y = 67$, $\sigma_X = 2.5$, $\sigma_Y = 3.5$ and $r(X, Y) = 0.8$. What is the equation of regression of Y on X ? [NDA 2020-II]
- (a) $Y = 0.175X - 5$ (b) $Y = 1.12X - 5.8$
 (c) $Y = 1.12X - 5$ (d) $Y = 0.17X + 5.8$
219. The numbers 4 and 9 have frequencies x and $(x - 1)$ respectively. If their arithmetic mean is 6, then what is the value of x ? [NDA 2020-II]
- (a) 2 (b) 3 (c) 4 (d) 5
220. The sum of deviations of n number of observations measured from 2.5 is 50. The sum of deviations of the same set of observations measured from 3.5 is -50. What is the value of n ? [NDA 2020-II]
- (a) 50 (b) 60 (c) 80 (d) 100
221. A data set of n observations has mean $2M$, while another data set of $2n$ observations has mean M . What is the mean of the combined data sets? [NDA 2020-II]

- (a) M (b) $\frac{3M}{2}$ (c) $\frac{2M}{3}$ (d) $\frac{4M}{3}$

222. Consider the following measures of central tendency for a set of N numbers :
 1. Arithmetic mean 2. Geometric mean [NDA 2021-I]

- Which of the above uses/use all the data?
 (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

223. The numbers of Science, Arts and Commerce graduates working in a company are 30, 70 and 50 respectively. If these figures are represented by a pie chart, then what is the angle corresponding to Science graduates? [NDA 2021-I]

- (a) 36° (b) 72° (c) 120° (d) 168°

224. For a histogram based on a frequency distribution with unequal class intervals, the frequency of a class should be proportional to [NDA 2021-I]

- (a) the height of the rectangle
 (b) the area of the rectangle
 (c) the width of the rectangle
 (d) the perimeter of the rectangle

225. The coefficient of correlation is independent of [NDA 2021-I]

- (a) change of scale only
 (b) change of origin only
 (c) both change of scale and change of origin
 (d) neither change of scale nor change of origin

226. The following table gives the frequency distribution of number of peas per pea pod of 198 pods :

Number of peas	1	2	3	4	5	6	7
Frequency	4	33	76	50	26	8	1

What is the median of this distribution? [NDA 2021-I]

- (a) 3 (b) 4 (c) 5 (d) 6

227. If M is the mean of n observations $x_1 - k, x_2 - k, x_3 - k, \dots, x_n - k$, where k is any real number, then what is the mean of $x_1, x_2, x_3, \dots, x_n$? [NDA 2021-I]

- (a) M (b) $M + k$ (c) $M - k$ (d) kM

228. What is the sum of deviations of the variate values 73, 85, 92, 105, 120 from their mean? [NDA 2021-I]

- (a) -2 (b) -1 (c) 0 (d) 5

229. If the mean of a frequency distribution is 100 and the coefficient of variation is 45%, then what is the value of the variance? [NDA 2021-I]

- (a) 2025 (b) 450 (c) 45 (d) 4.5

230. For which of the following sets of numbers do the mean, median and mode have the same value? [NDA 2021-I]

- (a) 12, 12, 12, 12, 24 (b) 6, 18, 18, 18, 30
 (c) 6, 6, 12, 30, 36 (d) 6, 6, 6, 12, 30

231. The mean of 12 observations is 75. If two observations are discarded, then the mean of the remaining observations is 65. What is the mean of the discarded observations?

[NDA 2021-I]

(a) 250

(b) 125

(c) 125

(d) Can't be determined

determined due to insufficient data

232. If the mode of the scores 10, 12, 13, 15, 15, 13, 12, 10, x is 15, then what is the value of x ? [NDA 2021-I]

- (a) 10 (b) 12 (c) 13 (d) 15

233. When the measure of central tendency is available in the form of mean, which one of the following is the most reliable and accurate measure of variability? [NDA 2021-II]

- (a) Range (b) Mean deviation
 (c) Standard deviation (d) Quartile deviation

DIRECTION : Consider the following for the next two (02) items that follow

Two regression lines are given as $3x - 4y + 8 = 0$ and

$$4x - 3y - 1 = 0.$$

234. Consider the following statements : [NDA 2021-II]

1. The regression line of y on x is

$$y = \frac{3}{4}x + 2.$$

2. The regression line of x on y is $x = \frac{3}{4}y + \frac{1}{4}$.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

235. Consider the following statements : [NDA 2021-II]

1. The coefficient of correlations r is $\frac{3}{4}$.

2. The means of x and y are 3 and 4 respectively.
 Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

236. The frequency curve (assuming unimodal) corresponding to the data obtained in an experiment is skewed to the left. What conclusion can be drawn from the curve?

[NDA 2022-II]

- (a) Mean > Median > Mode

- (b) Mean > Mode > Median

- (c) Median > Mean > Mode

- (d) Mode > Median > Mean

237. The variance of five positive observations is 3.6. If four of the observations are 2, 2, 4, 5 then what is the remaining observation? [NDA 2022-II]

- (a) 4 (b) 5 (c) 6 (d) 9

238. What is the arithmetic mean of 50 terms of an AP with first term 4 and common difference 4? [NDA 2022-II]

- (a) 50 (b) 51 (c) 100 (d) 102

239. What is the coefficient of mean deviation of 21, 34, 23, 39, 26, 37, 40, 20, 33, 27 (taken from mean)? [NDA 2022-II]

- (a) 0.11 (b) 0.22 (c) 0.33 (d) 0.44

DIRECTIONS : Consider the following for the next three (03) items that follow:

The algebraic sum of the deviations of a set of values $x_1, x_2, x_3, \dots, x_n$ measured from 100 is -20 and the algebraic sum of the deviations of the same set of values measured from 92 is 140.

240. What is the mean of the values? [NDA 2022-I]
 (a) 91 (b) 96 (c) 98 (d) 99
241. What is the algebraic sum of the deviations of the same set of values measured from 99? [NDA 2022-I]
 (a) 0 (b) 10 (c) 20 (d) 40
242. If the algebraic sum of the deviations of the same set of values measured from y is 180, then what is the value of y ? [NDA 2022-I]
 (a) 80 (b) 85 (c) 90 (d) 95

DIRECTIONS: Consider the following data for the next three (03) items that follow:

The marks obtained by 51 students in a class are in AP with its first term 4 and common difference 3.

243. What is the mean of the marks? [NDA 2022-I]
 (a) 67 (b) 71 (c) 75 (d) 79
244. What is the median of the marks? [NDA 2022-I]
 (a) 79.5 (b) 79 (c) 78.5 (d) 77

245. What is the sum of the deviations measured from the median? [NDA 2022-I]
 (a) -1 (b) 0 (c) 1 (d) 2

DIRECTIONS (Qs. 246-247): Consider the following frequency distribution for the next three (03) items that follow:

Class	0-20	20-40	40-60	60-80	80-100
Frequency	17	$p + q$	32	$p - 3q$	19

The total frequency is 120. The mean is 50.

246. What is the value of p ? [NDA 2022-I]
 (a) 25 (b) 26 (c) 27 (d) 28
247. What is the value of q ? [NDA 2022-I]
 (a) 1 (b) 2 (c) 3 (d) 4
248. If the frequency of each class is doubled, then what would be the mean? [NDA 2022-I]
 (a) 25 (b) 50 (c) 75 (d) 100

80

ANSWER KEY

1	(a)	26	(b)	51	(a)	76	(a)	101	(c)	126	(c)	151	(d)	176	(b)	201	(d)	226	(a)
2	(c)	27	(b)	52	(c)	77	(a)	102	(c)	127	(c)	152	(d)	177	(b)	202	(c)	227	(b)
3	(d)	28	(b)	53	(a)	78	(b)	103	(d)	128	(a)	153	(c)	178	(b)	203	(b)	228	(c)
4	(b)	29	(b)	54	(b)	79	(c)	104	(d)	129	(b)	154	(d)	179	(c)	204	(a)	229	(a)
5	(d)	30	(d)	55	(a)	80	(d)	105	(d)	130	(b)	155	(d)	180	(a)	205	(d)	230	(b)
6	(c)	31	(d)	56	(b)	81	(a)	106	(b)	131	(b)	156	(b)	181	(d)	206	(b)	231	(b)
7	(a)	32	(b)	57	(c)	82	(c)	107	(d)	132	(c)	157	(d)	182	(d)	207	(b)	232	(*)
8	(c)	33	(a)	58	(b)	83	(a)	108	(c)	133	(c)	158	(b)	183	(d)	208	(b)	233	(c)
9	(d)	34	(d)	59	(c)	84	(a)	109	(a)	134	(a)	159	(c)	184	(c)	209	(c)	234	(c)
10	(b)	35	(b)	60	(a)	85	(c)	110	(d)	135	(d)	160	(b)	185	(d)	210	(c)	235	(a)
11	(d)	36	(d)	61	(b)	86	(a)	111	(a)	136	(d)	161	(b)	186	(c)	211	(c)	236	(d)
12	(a)	37	(b)	62	(a)	87	(b)	112	(c)	137	(b)	162	(d)	187	(b)	212	(c)	237	(c)
13	(d)	38	(c)	63	(c)	88	(c)	113	(a)	138	(c)	163	(b)	188	(c)	213	(a)	238	(d)
14	(b)	39	(c)	64	(d)	89	(a)	114	(b)	139	(c)	164	(b)	189	(b)	214	(c)	239	(b)
15	(d)	40	(b)	65	(c)	90	(a)	115	(c)	140	(b)	165	(c)	190	(b)	215	(b)	240	(d)
16	(c)	41	(d)	66	(b)	91	(c)	116	(c)	141	(c)	166	(a)	191	(d)	216	(d)	241	(a)
17	(b)	42	(d)	67	(c)	92	(b)	117	(c)	142	(b)	167	(c)	192	(b)	217	(b)	242	(c)
18	(c)	43	(b)	68	(d)	93	(a)	118	(d)	143	(c)	168	(d)	193	(b)	218	(b)	243	(d)
19	(b)	44	(c)	69	(c)	94	(b)	119	(a)	144	(d)	169	(a)	194	(d)	219	(b)	244	(*)
20	(c)	45	(b)	70	(d)	95	(d)	120	(c)	145	(a)	170	(a)	195	(d)	220	(d)	245	(b)
21	(a)	46	(d)	71	(c)	96	(a)	121	(c)	146	(c)	171	(b)	196	(b)	221	(d)	246	(c)
22	(d)	47	(d)	72	(c)	97	(c)	122	(c)	147	(c)	172	(b)	197	(d)	222	(a)	247	(a)
23	(b)	48	(c)	73	(d)	98	(d)	123	(c)	148	(b)	173	(d)	198	(c)	223	(b)	248	(*)
24	(a)	49	(c)	74	(c)	99	(b)	124	(a)	149	(a)	174	(a)	199	(c)	224	(b)		
25	(d)	50	(c)	75	(b)	100	(d)	125	(b)	150	(c)	175	(c)	200	(a)	225	(c)		

HINTS & SOLUTIONS

1. (a) A simple bar diagram is most suitable for this.
2. (c) Mode is most suitable for this.
3. (d) The angle between two regression lines becomes zero if $r = \pm 1$.
4. (b) Since, expansion contains $(n+1)$ terms,

$$\text{Required mean} = \frac{n C_0 + n C_1 + n C_2 + \dots + n C_n}{(n+1)}$$

$$= \frac{2^n}{n+1}$$

5. (d) The standard deviation of n observation x_1, x_2, \dots, x_n is 6 and of y_1, y_2, \dots, y_n is 8, then the standard deviation of n observation $x_1 - y_1, x_2 - y_2, x_3 - y_3, \dots, x_n - y_n$ is $8 - 6 = 2$.
6. (c) Let $x = 31$ and $y = 10$

C.I x	f	c	f
8.5–13.5	11	7	7
13.5–18.5	16	31	38
18.5–23.5	21	40	78
23.5–28.5	26	10	88
28.5–33.5	31	10	98
33.5–38.5	36	2	100

$$\therefore N = 100, \therefore \frac{N}{2} = 50$$

∴ Median group is 18.5–23.5

$$\therefore L_1 = 18.5, L_2 = 23.5, C = 38, h = 5, f = 40$$

$$\therefore \text{Median} = L_1 + \left(\frac{\frac{N}{2} - C}{f} \right) \times h$$

$$= 18.5 + \frac{50 - 38}{40} \times 5 = 18.5 + \frac{12 \times 5}{40} = 18.5 + 1.5 = 20$$

Thus, our assumption is correct. Therefore missing numbers are 31 and 10 respectively.

7. (a) All are correct statement and R is correct explanation of A.
8. (c) The x-coordinate of the point of intersection of two ogives, gives median.

9. (d) Average score of A = $\frac{71+56+45+89+54+44}{6}$

$$= \frac{359}{6} = 59.83$$

and average score of

$$B = \frac{55+74+83+54+38+52}{6} = \frac{356}{6} = 59.33$$

10. Variation is lesser in case of B than A. So, the average scores of A and B are not same but B is consistent.
11. (b) Joining the mid points of the upper horizontal sides of each rectangle of a histogram by straight lines, the figure so obtained is known as frequency polygon.
12. (d) The definition of Mode fails if the curve drawn with the help of given data is symmetrical.

12. (a) Let n denote number of workers and x , the pay. $n_1 = 30, n_2 = 20, x_1 = ₹ 500, x_2 = ₹ 600$
 $\therefore \text{Combined average} = \frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$
 $= \frac{30 \times 500 + 20 \times 600}{30 + 20} = \frac{15000 + 12000}{50} = \frac{27000}{50} = 540$
 Combined average pay = ₹ 540

13. (d) 50^{th} decile = $\frac{50}{10} = 5$
 and 5^{th} percentile = $\frac{5}{100} = 5 \neq \frac{5}{100}$
14. (b) Let there be x number of boys and y number of girls.
 Total students = $x + y$
 Total weight of the students = $(x + y)60$
 Total weight for boys = $x \times 70$
 Total weight for girls = $y \times 55$
 Hence, $(x + y)60 = 70x + 55y$
 $60x + 60y = 70x + 55y$
 $5y = 10x \Rightarrow y = 2x$
 $\frac{x}{y} = \frac{1}{2} \Rightarrow x:y = 1:2$

15. (d) From observation of the graph it is noted the nature is similar, but are centered around different values, hence, they have same variance, but different mean values.

16. (c) Slope of line of regression of Y and X, is 30° . So
 $b_{yx} = \tan 30^\circ = \frac{1}{\sqrt{3}}$ and for X and Y it is 60° .

$$\text{Hence, } \frac{1}{b_{xy}} = \tan 60^\circ = \sqrt{3}$$

$$b_{yx} = \frac{1}{\sqrt{3}} \text{ and } b_{xy} = \frac{1}{\sqrt{3}}$$

$$r(x, y) = r^2 = b_{yx} \cdot b_{xy} = \frac{1}{3}$$

$$\text{so, } r = \pm \frac{1}{\sqrt{3}}$$

Since, b_{yx} and b_{xy} are both positive, $r = + \frac{1}{\sqrt{3}}$

17. (b) To measure the intelligence of a group of students mode will be more suitable.

18. (c) As given, $np = 4$ and $npq = 3$
 [where p is the probability of success and q is the probability of failure for an event to occur, and 'n' is the number of trials]

$$\Rightarrow q = \frac{npq}{np} = \frac{3}{4}$$

$$\text{Also, } p = 1 - q = 1 - \frac{3}{4} = \frac{1}{4}$$