

NDA 2 2024

LIVE

MATHS

STATISTICS

CLASS 2

NAVJYOTI SIR

SSBCrack
EXAMS

Crack
EXAMS



09 July 2024 Live Classes Schedule

8:00AM	09 JULY 2024 DAILY CURRENT AFFAIRS	RUBY MA'AM
9:00AM	09 JULY 2024 DAILY DEFENCE UPDATES	DIVYANSHU SIR

SSB INTERVIEW LIVE CLASSES

9:00AM	OVERVIEW OF PIQ FORM & PI	ANURADHA MA'AM
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NDA 2 2024 LIVE CLASSES

1:00PM	GS - PHYSICS - CLASS 8	NAVJYOTI SIR
4:00PM	MATHS - STATISTICS - CLASS 2	NAVJYOTI SIR
5:30PM	ENGLISH - USAGE OF PAIRED WORDS - CLASS 1	ANURADHA MA'AM

CDS 2 2024 LIVE CLASSES

1:00PM	GS - PHYSICS - CLASS 8	NAVJYOTI SIR
5:30PM	ENGLISH - USAGE OF PAIRED WORDS - CLASS 1	ANURADHA MA'AM



VARIANCE AND STANDARD DEVIATION

$$\text{Var} = \sigma^2 = \frac{\sum fx^2}{n} - \left(\frac{\sum fx}{n} \right)^2$$

Scale \longrightarrow $\text{Var}(c \cdot x) = c^2 \text{Var}(x)$ (multiplying each observation by same no.)

Origin \longrightarrow $\text{Var}(c+x) = \text{Var}(x)$ (adding " " " " " " "
 (independent)

SD (σ)

Scale \longrightarrow $\text{SD}(c \cdot x) = \underbrace{c \cdot \text{SD}(x)}$

Origin \longrightarrow independent \longleftarrow

CORRELATION

The tendency of simultaneous variation between two variables is called correlation. It denotes the degree of interdependence between variables.

COEFFICIENT OF CORRELATION

$$\text{Coefficient of variation} = \frac{\text{Deviation}}{\text{Mean}} \times 100 = \frac{\sigma}{\bar{x}} \times 100$$

Greater is the value of coefficient of variation of a distribution, there is more variability in that distribution.

$$\text{COV} = \frac{\text{Standard deviation}}{\text{Mean}} \times 100 = \frac{\sigma}{\bar{x}} \times 100$$

COV \uparrow \rightarrow dispersed data ——— 14, 24, 28, 36, 48, 6

COV \downarrow \rightarrow consistent data ——— 8, 9, 10, 12, 14, 16

COEFFICIENT OF CORRELATION

- Independent of Scale.
- Not determined for change in origin.

COVARIANCE

Measure of relationship between two random variables.

The covariance between two variables x and y with n pairs of observations $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$ is defined as

$$\text{cov}(x, y) = \sigma_{xy} = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{n}$$

$$= \left(\frac{\sum x_i y_i}{n} - \bar{x}\bar{y} \right)$$

points on graph

where,

$$\bar{x} = \frac{\sum x_i}{n} \quad \text{and} \quad \bar{y} = \frac{\sum y_i}{n}$$

CORRELATION COEFFICIENT (r)

Measure the strength of relationship between the two variables.

The correlation coefficient $r(x, y)$, between two variables x and y is given by

$$r = \frac{\text{cov}(x, y)}{\sqrt{\text{var}(x) \cdot \text{var}(y)}} = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \cdot \sum (y_i - \bar{y})^2}}$$

CHARACTERISTICS OF CORRELATION COEFFICIENT

1. $-1 \leq r \leq 1$.
2. If $r = 1$, the correlation is perfect and positive.
3. If $r = -1$, the correlation is perfect and negative.
4. The coefficient of correlation is a pure number, it is independent of the unit of measurement.
5. The coefficient of correlation is independent of the change of origin and scale.
6. If $0 < r < 1$, there is a positive correlation between x and y . $x \uparrow, y \uparrow$
7. If $-1 < r < 0$, there is a negative correlation between x and y . $x \uparrow, y \downarrow$ or $y \uparrow, x \downarrow$
8. If $r = 0$, then x and y are said to be uncorrelated. (independent)

REGRESSION & LINES OF REGRESSION

The term regression means “stepping back towards the average”.

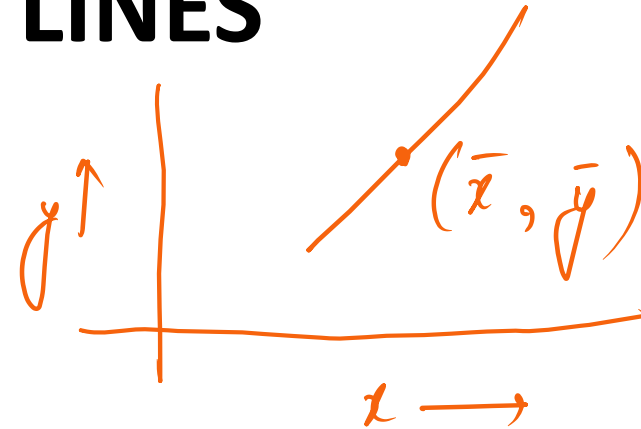
The line of regression is the line which gives the best estimate to the value of one variable for any specific value of the other variable.

x	y	
1	2	$\rightarrow (1, 2)$
2	3	$\rightarrow (2, 3)$
4	6	$\rightarrow (4, 6)$
7	3	$\rightarrow (7, 3)$

EQUATIONS OF REGRESSION LINES

The line of regression of y on x is

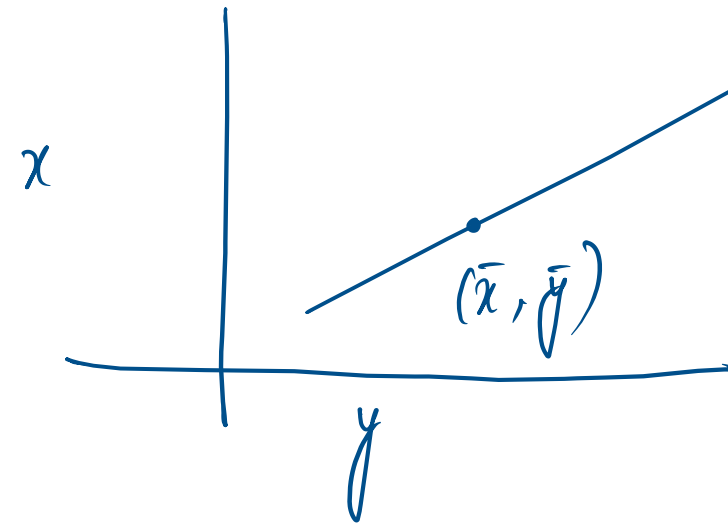
$$y - \bar{y} = r \frac{\sigma_y}{\sigma_x} (x - \bar{x})$$



$$b_{yx} = r \frac{\sigma_y}{\sigma_x}$$

The line of regression of x on y is

$$\underline{x - \bar{x}} = r \frac{\sigma_x}{\sigma_y} (y - \bar{y})$$



$$\frac{1}{b_{xy}} = r \frac{\sigma_x}{\sigma_y}$$

$$r = \sqrt{b_{yx} \times b_{xy}}$$

b_{yx} & $\frac{1}{b_{xy}}$ are slopes of regression lines.

PROPERTIES OF REGRESSION LINES

1. The two lines of regression pass through the point (\bar{x}, \bar{y}) .
2. Slope of the line of regression of y on $x = b_{yx}$.
3. Slope of the line of regression of x on $y = \frac{1}{b_{xy}}$.

REGRESSION COEFFICIENT

'b' the slope of the line of regression of y on x is also called the coefficient of regression of y on x .

$$\text{Regression coefficient of } y \text{ on } x = \underbrace{b_{yx}} = r \frac{\sigma_y}{\sigma_x}.$$

Similarly,

$$\text{Regression coefficient of } \underbrace{x \text{ on } y} = b_{xy} = r \frac{\sigma_x}{\sigma_y}.$$

PROPERTIES OF REGRESSION COEFFICIENT

1. Both regression coefficients and r have the same sign.

$$b_{xy}, b_{yx}, r$$

2. Coefficient of correlation is the geometric mean between the regression coefficients

$$r = \pm \sqrt{b_{yx} \times b_{xy}}$$

3. If one of the regression coefficients is greater than unity, the other must be less than unity.

4. The modulus value of the arithmetic mean of the regression coefficients is not less than the modulus value of the correlation coefficient r . *i.e.*,

$$\left| \frac{b_{yx} + b_{xy}}{2} \right| > |r|$$

5. Regression coefficients are independent of the change of origin but not of scale.

ANGLE BETWEEN TWO LINES OF REGRESSION

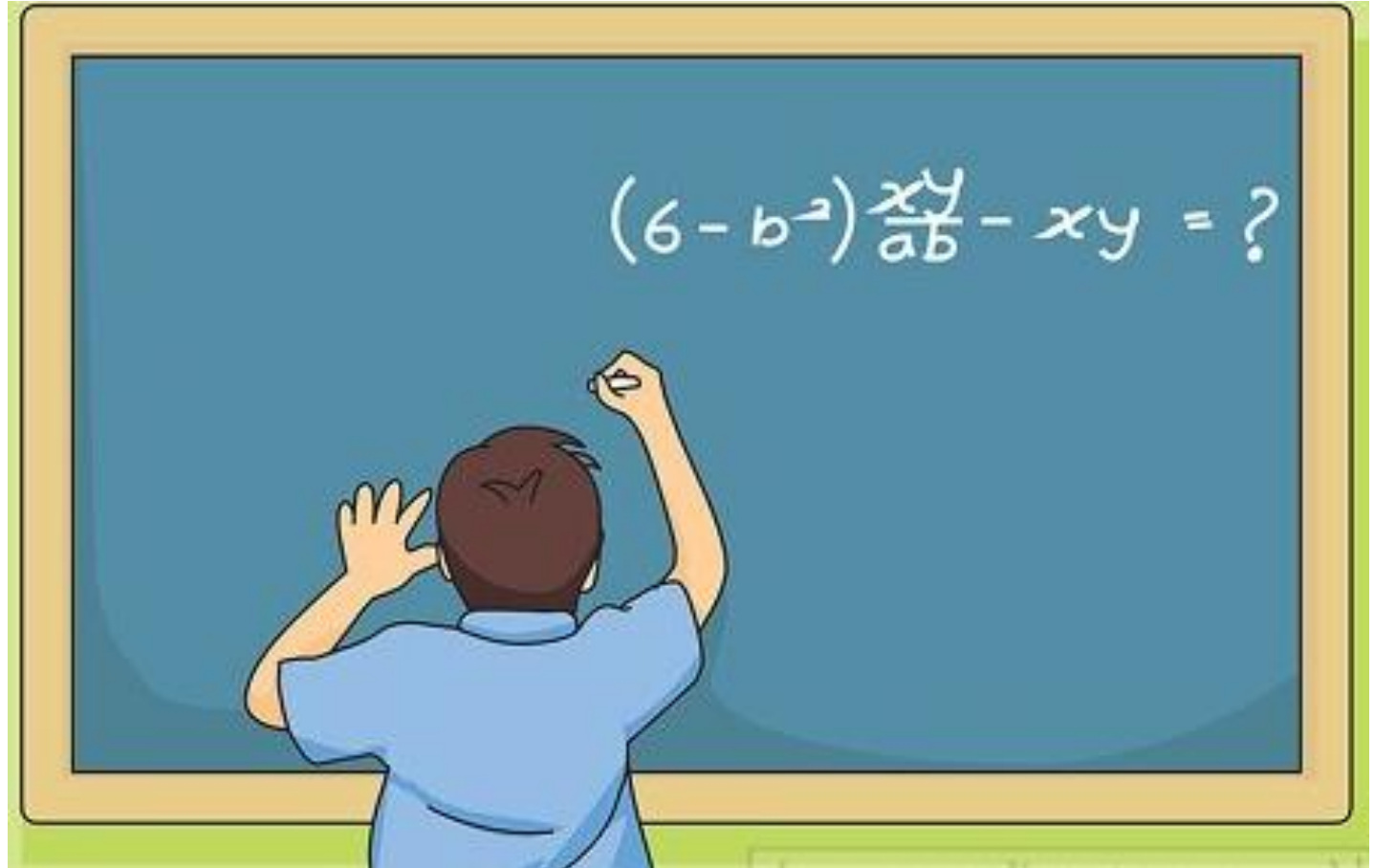
If θ be the angle between the two regression lines, then

$$\tan \theta = \pm \frac{(1 - r^2)}{|r|} \cdot \left(\frac{\sigma_x \sigma_y}{\sigma_x^2 + \sigma_y^2} \right)$$

If $r = 0$, then $\theta = \frac{\pi}{2}$, *i.e.*, if two variables are uncorrelated, then the lines of regression are perpendicular to each other.

If $r = \pm 1$, then $\theta = 0$ or π , *i.e.*, in the case of perfect correlation, positive or negative the two lines of regression coincide.

PRACTISE
TIME !



Q) Students of three sections of a class, having 30, 30 and 40 students appeared for a test of 100 marks. The arithmetic means of the marks of the three sections are 72.2, 69.0 and 64.1 in that order. What is the arithmetic mean of the marks of all the students of the three sections?

- (a) 66.6
(c) 68.0

- (b) 67.3
(d) 70.6

$$\frac{(72.2 \times 30) + (69.0 \times 30) + (64.1 \times 40)}{30 + 30 + 40}$$

$$30 + 30 + 40$$

Total marks of all 3 sections

Total number of students of 3 sections

- Q) Students of three sections of a class, having 30, 30 and 40 students appeared for a test of 100 marks. The arithmetic means of the marks of the three sections are 72.2, 69.0 and 64.1 in that order. What is the arithmetic mean of the marks of all the students of the three sections?
- (a) 66.6 (b) 67.3
(c) 68.0 (d) 70.6

Ans: (c)

Q) 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 ?

- (a) 5
(c) 15

- (b) 7
 (d) 21

Mean is dependent on change in scale & origin (add any number)
(multiply by any number)

$$\left. \begin{aligned} \bar{x}(eX) &= e\bar{x}(X) \\ \bar{x}(X+c) &= \bar{x}(X)+c \end{aligned} \right\}$$

$$(5) + 2 = (7) \times 3 = \boxed{21}$$

Q) 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 ?

- (a) 5
- (c) 15

- (b) 7
- (d) 21

Ans: (d)

Q) Variance is always independent of the change of

- (a) ✓ origin but not scale
- (b) scale only
- (c) both origin and scale
- (d) None of the above

$$\text{Var}(cX) = c^2 \text{Var}(X) \text{ — dependent on scale.}$$

$$\text{Var}(X+c) = \text{Var}(X) \text{ — independent of origin}$$

Q) Variance is always independent of the change of

- (a) origin but not scale
- (b) scale only
- (c) both origin and scale
- (d) None of the above

Ans: (a)

Q) 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?

(a) $\frac{1}{3}$

(b) $\frac{1}{2}$

(c) $\frac{2}{3}$

(d) $\frac{3}{4}$

(r)

$$4y - 15x + 410 = 0$$

$$y = \frac{15x - 410}{4}$$

$$y = \left(\frac{15}{4}\right)x - \left(\frac{410}{4}\right)$$

of form $y = mx + c$

$$m = b_{yx} = \frac{15}{4}$$

$$30x - 2y - 825 = 0$$

$$x = \frac{2y + 825}{30}$$

$$x = \left(\frac{2}{30}\right)y + \frac{825}{30}$$

of form $x = my + c$

$$m = b_{xy} = \frac{2}{30} = \frac{1}{15}$$

$$r = \sqrt{b_{yx} \times b_{xy}}$$

$$= \sqrt{\frac{15}{4} \times \frac{1}{15}}$$

$$= \sqrt{\frac{1}{4}} = \left(\frac{1}{2}\right) \checkmark$$

Q) 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?

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

Ans: (b)

Q) The variance of 20 observations is 5. If each observation is multiplied by 2, then what is the new variance of the resulting observations ?

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

New Variance = (number multiplied with each observation)² (Old variance)

$$= (2)^2 \times 5$$

$$= \textcircled{20}$$

Variance is dependent on change in scale.

$$\text{Var}(cX) = c^2 \text{Var}(X)$$

Q) The variance of 20 observations is 5. If each observation is multiplied by 2, then what is the new variance of the resulting observations ?

- (a) 5
(c) 20

- (b) 10
(d) 40

Ans: (c)

Q) What is the arithmetic mean of the series

$${}^n C_0, {}^n C_1, \dots, {}^n C_n, ?$$

(a) $\frac{2^n}{n}$

~~(b)~~ $\frac{2^n}{(n+1)}$

(c) $\frac{2^{(n+1)}}{n}$

(d) $\frac{2^{(n+1)}}{(n+1)}$

$${}^n C_0, {}^n C_1, \dots, {}^n C_n$$

no. of observations = $(n+1)$

$${}^n C_0 + {}^n C_1 + \dots + {}^n C_n$$

$$(1+x)^n = {}^n C_0 x^0 + {}^n C_1 x^1 + {}^n C_2 x^2 + \dots + {}^n C_n x^n$$

Put $x=1$,

$$2^n = {}^n C_0 + {}^n C_1 + {}^n C_2 + \dots + {}^n C_n$$

$$\text{Mean} = \frac{\text{Sum}}{n+1} = \frac{2^n}{n+1}$$

Q) What is the arithmetic mean of the series

$${}^n C_0, {}^n C_1, \dots, {}^n C_n, ?$$

(a) $\frac{2^n}{n}$

(b) $\frac{2^n}{(n+1)}$

(c) $\frac{2^{(n+1)}}{n}$

(d) $\frac{2^{(n+1)}}{(n+1)}$

Ans: (b)

Q) 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”?

(a) 20°

(b) 36°

(c) 72°

(d) 144°

$$\frac{\text{part}}{\text{whole}} \times 360^\circ = \text{central angle of part}$$

$$\frac{20}{100} \times 360 = \underline{72^\circ}$$

- Q) 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”?
- (a) 20° (b) 36° (c) 72° (d) 144°

Ans: (c)

Q) 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?

(a) 10

 (b) 20

(c) 40

(d) 70

$$\text{coefficient of correlation} = \frac{\text{S.D. (5)}}{\text{Mean } (\bar{x})} \times 100$$

$$\begin{array}{l} \text{New} \\ \hline \text{S.D.} = 2 \\ \text{Mean, } \bar{x} = 5 + 5 = \underline{10} \end{array} \left. \vphantom{\begin{array}{l} \text{New} \\ \hline \text{S.D.} = 2 \\ \text{Mean, } \bar{x} = 5 + 5 = \underline{10} \end{array}} \right\} = \frac{2}{10} \times 100 = \boxed{20}$$

Q) 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?

(a) 10

(b) 20

(c) 40

(d) 70

Ans: (b)

Q) If two variables X and Y are independent, then what is the correlation coefficient between them?

(r)

(a) 1

(b) -1

(c) 0

(d) None of these

$r = 1 \Rightarrow$ +ve perfect correlation

$r = -1 \Rightarrow$ -ve " "

$r = 0 \Rightarrow$ uncorrelated / independent

Q) If two variables X and Y are independent, then what is the correlation coefficient between them?

- (a) 1 (b) -1
(c) 0 (d) None of these

Ans: (c)

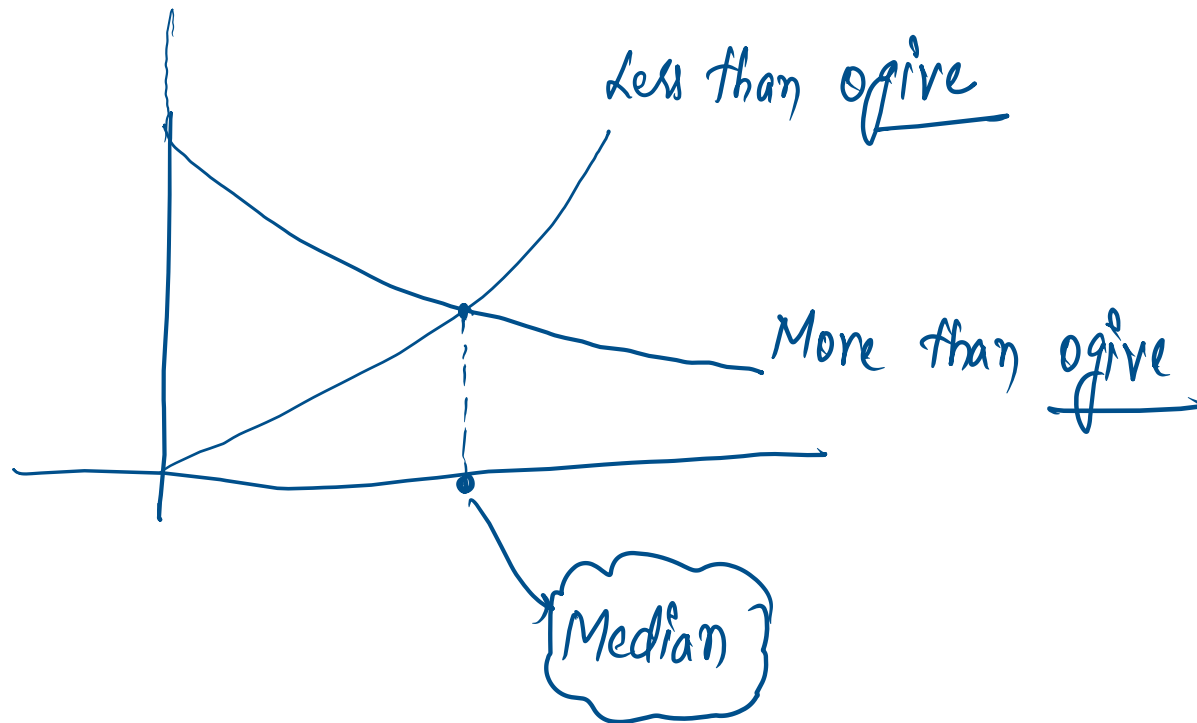
Q) Which one of the following can be obtained from an ogive?

(a) Mean

(b) Median

(c) Geometric Mean

(d) Mode



ogive - cumulative frequency curve

Q) Which one of the following can be obtained from an ogive?

(a) Mean

(b) Median

(c) Geometric Mean

(d) Mode

Ans: (b)

Q) 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?

(a) 42, 45

(b) 41, 43

(c) 43, 46

(d) 40, 40

$$42 = \frac{(x+1) + (x+3)}{2} = \frac{2x+4}{2} = x+2$$

$$x = 40$$

for even no. of observations (n),

$$\text{Median} = \frac{\left(\frac{n}{2}\right)^{\text{th}} + \left(\frac{n}{2} + 1\right)^{\text{th}}}{2}$$

$$x+1 \rightarrow 41$$

$$x+3 \rightarrow 43$$

Q) 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?

(a) 42, 45

(b) 41, 43

(c) 43, 46

(d) 40, 40

Ans: (b)

Q) The marks scored by two students A and B in six subjects are given below:

A	71	56	45	89	54	44
B	55	74	83	54	38	52

Which one of the following statements is correct ?

- (a) The average scores of A and B are same but A is consistent α
- (b) The average scores of A and B are not same but A is consistent
- (c) The average scores of A and B are same but B is consistent α
- (d) The average scores of A and B are not same but B is consistent

A	+11 71	-4 56	-15 45	+29 89	-6 54	-16 44
B	-5 55	+14 74	+23 83	-6 54	-22 38	-8 52

Mean

$$A \rightarrow \frac{71 + 56 + 45 + 89 + 54 + 44}{6}$$

$$B \rightarrow \frac{55 + 74 + 83 + 54 + 38 + 52}{6}$$

$$A \rightarrow \frac{359}{6} = 59.833$$

60

$$B \rightarrow \frac{356}{6} = 59.33$$

60

Q) The marks scored by two students A and B in six subjects are given below:

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B	55	74	83	54	38	52

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- (b) The average scores of A and B are not same but A is consistent
- (c) The average scores of A and B are same but B is consistent
- (d) The average scores of A and B are not same but B is consistent

Ans: (d)

Q) If the slopes of the line of regression of Y and X and of X and Y are 30° and 60° respectively, then $r(X, Y)$ is :

(a) -1

(b) 1

(c) $\frac{1}{\sqrt{3}}$

(d) $-\frac{1}{\sqrt{3}}$

Q) If the slopes of the line of regression of Y and X and of X and Y are 30° and 60° respectively, then $r(X, Y)$ is :

(a) -1

(b) 1

(c) $\frac{1}{\sqrt{3}}$

(d) $-\frac{1}{\sqrt{3}}$

Ans: (c)

Q) If the regression coefficient of Y on X is -6 and the correlation coefficient between X and Y is $-\frac{1}{2}$, then the regression coefficient of X on Y would be

- (a) $\frac{1}{24}$ (b) $-\frac{1}{24}$ (c) $-\frac{1}{6}$ (d) $\frac{1}{6}$

Q) If the regression coefficient of Y on X is -6 and the correlation coefficient between X and Y is $-\frac{1}{2}$, then the regression coefficient of X on Y would be

- (a) $\frac{1}{24}$ (b) $-\frac{1}{24}$ (c) $-\frac{1}{6}$ (d) $\frac{1}{6}$

Ans: (b)

Q) In computing a measure of the central tendency for any set of 51 numbers, which one of the following measures is well-defined but uses only very few of the numbers of the set?

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

Q) In computing a measure of the central tendency for any set of 51 numbers, which one of the following measures is well-defined but uses only very few of the numbers of the set?

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

Ans: (d)

Q) The data below record the itemwise quarterly expenditure of a private organization :

Item of expenditure	Amount (in lakh rupees)
1. Salaries	6.0
2. TA & DA	4.9
3. House rent and postage	3.6
4. All other expenses	5.5
Total :	<u>20.0</u>

The data is represented by a pie diagram. What is the sectorial angle of the sector with largest area?

- (a) 120° (b) 108°
(c) 100° (d) 90°

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4. All other expenses	5.5
Total :	<u>20.0</u>

The data is represented by a pie diagram. What is the sectorial angle of the sector with largest area?

- (a) 120° (b) 108°
(c) 100° (d) 90°

Ans: (b)

Q) 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

(a) $Y = 3.2X + 58$

(b) $X = 3.2Y + 58$

(c) $X = -8 + 0.2Y$

(d) $Y = -8 + 0.2X$

Q) 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

(a) $Y = 3.2X + 58$

(b) $X = 3.2Y + 58$

(c) $X = -8 + 0.2Y$

(d) $Y = -8 + 0.2X$

Ans: (c)

Q) Consider the following statements:

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 |

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1. If the correlation coefficient $r_{xy} = 0$, then the two lines of regression are parallel to each other.
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Which of the above statements is/are correct?

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

Ans: (d)

Q) 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?

- (a) 10
- (c) 40

- (b) 20
- (d) 70

Q) 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?

- (a) 10
- (b) 20
- (c) 40
- (d) 70

Ans: (b)

Q) 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?

(a) 12 and 18

(b) 18 and 12

(c) 13 and 17

(d) 17 and 13

Q) 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?

(a) 12 and 18

(b) 18 and 12

(c) 13 and 17

(d) 17 and 13

Ans: (c)

Q) A random sample of 20 people is classified in the following table according to their ages:

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

Q) A random sample of 20 people is classified in the following table according to their ages:

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

Ans: (b)

- Q) The median of a set of 9 distinct observations is 20.5. If each of the largest 4 observations of the set is increased by 2, then the median of the new set
- (a) remains the same as that of the original set
 - (b) is increased by 2
 - (c) is decreased by 2
 - (d) is two times the original median.

- Q) The median of a set of 9 distinct observations is 20.5. If each of the largest 4 observations of the set is increased by 2, then the median of the new set
- (a) remains the same as that of the original set
 - (b) is increased by 2
 - (c) is decreased by 2
 - (d) is two times the original median.

Ans: (a)

Q) Consider the following three methods of collecting data

- (1) collecting data from government offices
- (2) collecting data from public libraries
- (3) collecting data by telephonic interview

Select the correct answer using the code given below

- (a) All the three methods give secondary data
- (b) 1 and 2 give secondary and 3 gives primary data
- (c) 1 and 3 give secondary and 2 gives primary data
- (d) 2 and 3 give secondary and 1 gives primary data

Q) Consider the following three methods of collecting data

- (1) collecting data from government offices
- (2) collecting data from public libraries
- (3) collecting data by telephonic interview

Select the correct answer using the code given below

- (a) All the three methods give secondary data
- (b) 1 and 2 give secondary and 3 gives primary data
- (c) 1 and 3 give secondary and 2 gives primary data
- (d) 2 and 3 give secondary and 1 gives primary data

Ans: (b)

Q) Consider the following statements :

- (A) Mode can be computed from histogram
- (B) Median is not independent of change of scale
- (C) Variance is independent of change of origin and scale.

Which of these is / are correct ?

- (a) (A), (B) and (C) (b) only (B)
- (c) only (A) and (B) (d) only (A)

Q) Consider the following statements :

- (A) Mode can be computed from histogram
- (B) Median is not independent of change of scale
- (C) Variance is independent of change of origin and scale.

Which of these is / are correct ?

- (a) (A), (B) and (C)
- (b) only (B)
- (c) only (A) and (B)
- (d) only (A)

Ans: (c)

Q)In a series of $2n$ observations, half of them equal a and remaining half equal $-a$. If the standard deviation of the observations is 2, then $|a|$ equals.

(a) $\frac{\sqrt{2}}{n}$

(b) $\sqrt{2}$

(c) 2

(d) $\frac{1}{n}$

Q)In a series of $2n$ observations, half of them equal a and remaining half equal $-a$. If the standard deviation of the observations is 2, then $|a|$ equals.

(a) $\frac{\sqrt{2}}{n}$

(b) $\sqrt{2}$

(c) 2

(d) $\frac{1}{n}$

Ans: (c)

Q) If in a frequency distribution, the mean and median are 21 and 22 respectively, then its mode is approximately

- (a) 22.0 (b) 20.5 (c) 25.5 (d) 24.0

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- (a) 22.0 (b) 20.5 (c) 25.5 (d) 24.0

Ans: (d)

Q) The arithmetic mean of 1, 8, 27, 64,..... up to n terms is given by

(a) $\frac{n(n+1)}{2}$

(b) $\frac{n(n+1)^2}{2}$

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

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

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Ans: (c)

Q) The mean of the numbers $a, b, 8, 5, 10$ is 6 and the variance is 6.80. Then which one of the following gives possible values of a and b ?

(a) $a = 0, b = 7$

(b) $a = 5, b = 2$

(c) $a = 1, b = 6$

(d) $a = 3, b = 4$

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Ans: (d)

Q) In a study on the relationship between investment (X) and profit (Y), the following two regression equations were obtained based on the data on X and Y

$$3X + Y - 12 = 0$$

$$X + 2Y - 14 = 0$$

What is the mean \bar{X} ?

(a) 6

(b) 5

(c) 4

(d) 2

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What is the mean \bar{X} ?

(a) 6

(b) 5

(c) 4

(d) 2

Ans: (d)

Q) If the mean deviation of the numbers $1, 1 + d, 1 + 2d, \dots, 1 + 100d$ from their mean is 255, then d is equal to :

- (a) 20.0 (b) 10.1 (c) 20.2 (d) 10.0

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Ans: (b)

Q) Consider the following statements in respect of histogram :

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 |

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Ans: (a)

Q) 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?

(a) 3.8

(b) 4.9

(c) 5.7

(d) 6.0

Q) 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?

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(b) 4.9

(c) 5.7

(d) 6.0

Ans: (b)

- Q)** The mean of the data set comprising of 16 observations is 16. If one of the observation valued 16 is deleted and three new observations valued 3, 4 and 5 are added to the data, then the mean of the resultant data, is:
- (a) 15.8 (b) 14.0 (c) 16.8 (d) 16.0

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- (a) 15.8 (b) 14.0 (c) 16.8 (d) 16.0

Ans: (b)

Q) If the standard deviation of the numbers 2, 3, a and 11 is 3.5, then which of the following is true?

(a) $3a^2 - 34a + 91 = 0$

(b) $3a^2 - 23a + 44 = 0$

(c) $3a^2 - 26a + 55 = 0$

(d) $3a^2 - 32a + 84 = 0$

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- (a) $3a^2 - 34a + 91 = 0$ (b) $3a^2 - 23a + 44 = 0$
(c) $3a^2 - 26a + 55 = 0$ (d) $3a^2 - 32a + 84 = 0$

Ans: (d)

Q) The regression lines will be perpendicular to each other if the coefficient of correlation r is equal to

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

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Ans: (d)

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