Test - 03

Sampurna 2.0 January 2025

Quantitative Aptitude

Q1 If $b_{yx} = 0.5,\ b_{xy} = 0.45,$ then the value of correlation coefficient is

(A) 0.23 (B) 0.25

(C) 0.39 (D) 0.47

Q2 In the year 2010, the price index for a particular item is 150 with the base year 2005. What does this index value indicate?

(A) The prices of the item have decreased by 50% since 2005.

(B) The prices of the item have increased by 50% since 2005.

(C) The prices of the item have increased by 150% since 2005.

(D) The prices of the item have increased by 50 units since 2005.

Q3 The number of test of Adequacy is

(A) 2 (B) 3

(C) 4 (D) 5

Q4 In case 'Shoe size and intelligence'

(A) Positive correlation

(B) Negative correlation

(C) No correlation

(D) None

Q5 Fisher's ideal Formula does not satisfy _____ test.

(A) Unit test

(B) circular test

(C) Time reversal test

(D) None of these

Q6 Scatter diagram does not help us to

(A) find the type of correlation

(B) identify whether variables are correlated or not

(C) determine the linear or non-linear correlation

(D) find the numerical value of correlation coefficient

Q7 Given the following data: $b_{xy} = 0.4$ & $b_{yx} = 1.6$. The coefficient of determination is :

(A) 0.74 (B) 0.42

(C) 0.58 (D) 0.64

Q8 In price index, when a new commodity is required to be added, which of the following is used?

(A) Shifted price index

(B) Splicing price index

(C) Deflating price index

(D) Value price index

Q9 The circular test is an extension of:

(A) The time reversal test

(B) The factor reversal test

(C) The unit test

(D) None of these

Q10 From the following data constructed the index number by Laspeyre's method:

$\Sigma P_1Q_1 = 100,\ \Sigma P_0Q_1 = 86,\ \Sigma P_0Q_0 = 83,\ \Sigma P_1Q_0 = 106$

(A) 130.36 (B) 131.51

(C) 130.59 (D) 127.71

Q11 The regression equation are 2x + 3y + 1 = 0 and 5x + 6y + 1 = 0, then mean of x and y respectively are

(A) -1, -1 (B) -1, 1
(C) 1, -1 (D) 2, 3

Q12 If the sum of squares of the rank difference in Mathematics and Physics marks of 10 students is 22, then the coefficient of rank correlation is:
(A) 0.267 (B) 0.867
(C) 0.92 (D) None

Q13 When the prices for quantities consumed of all commodities are changing in the same ratio, then the index numbers due to Laspeyre's and Paasche's will be
(A) Equal
(B) Unequal
(C) Reciprocal of Marshall Edge worth index number
(D) Reciprocal of fisher index number

Q14 Determine Spearman's rank correlation coefficient from the given data
$D^2 = 30,\ N = 10.$
(A) R = 0.82 (B) R = 0.32
(C) R = 0.40 (D) None of these

Q15 Fisher's index number is called as ideal index number because it satisfies
(A) Factor reversal test
(B) Time reversal test
(C) Both factor and time reversal test
(D) Circular test

Q16 The index number for the year 2012 taking 2011 as base using simple average of price relatives method from data given below is:

Commodity	A	B	C	D	E
Price in 2011 (P_0)	115	108	95	80	90
Price in 2012 (P_1)	125	117	108	95	95

(A) 112 (B) 117
(C) 120 (D) 111

Q17 The circular test is known as
(A) $P_{01} \times P_{12} \times P_{20} = 1$
(B) $P_{12} \times P_{01} \times P_{20} = 1$
(C) $P_{20} \times P_{12} \times P_{01} = 1$
(D) $P_{02} \times P_{21} \times P_{12} = 1$

Q18 If the sum of square of differences of rank is 50 and number of items is 8, then what is the value of rank correlation coefficient?
(A) 0.59 (B) 0.40
(C) 0.36 (D) 0.63

Q19 If the correlation between X and Y is r, $U = \frac{X-5}{10}$ and $V = \frac{Y-7}{2}$ then r_{uv} is
(A) r (B) $-r$
(C) $\frac{r-5}{2}$ (D) $\frac{r-7}{10}$

Q20 Ina data group Bowley's and Laspeyre's index is as follows.
Bowley's Index number = 150, Laspeyre's Index number = 180, then Paasche's index number is
(A) 120 (B) 30
(C) 165 (D) None of these

Q21 P_{10} is the index for time.
(A) 1 on 0 (B) 0 on 1
(C) 1 on 1 (D) 0 on 0

Q22 For year 2015, price index was 267% with base year 2005. The percentage increase in price index over base year 2005 is:
(A) 267% (B) 67%
(C) 167% (D) None of these

Q23 From the following data constructed the index number by Laspeyre's method:
$\sum P_1Q_1 = 100,\ \sum P_0Q_1 = 86,\ \sum P_0Q_0 = 83$,

and $\sum P_1Q_0 = 106$

(A) 130.36 (B) 131.51

(C) 130.59 (D) 127.71

Q24 Which index measures the change from month to month in the cost of a representative basket of goods and services of the type bought by a typical household?

(A) Retail Price Index

(B) Laspeyre's Index

(C) Fisher's index

(D) Paasche's Index

Q25 If Fisher's index = 150 and Paasche's Index = 144, then Laspeyre's index is

(A) 147 (B) 156.25

(C) 104.17 (D) 138

Q26 In price index, when a new commodity is required to be added, which of the following index is used?

(A) Shifted price index

(B) Splicing price index

(C) Deflating price index

(D) Value price index

Q27 The following data relate to the heights of 10 pairs of fathers and sons:

(175, 173), (172, 172), (167, 171), (168, 171), (172, 173), (171, 170), (174, 173), (176, 175), (169, 170), (170, 173). The regression equation of height of son on that of father is given by

(A) $y = 100 + 5x$

(B) $y = 102.60 + 0.4055x$

(C) $y = 89.653 + 0.582x$

(D) $y = 88.758 + 0.562x$

Q28 From the following data base year :

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	4	3	6	2
B	5	4	6	4
C	7	2	9	2
D	2	3	1	5

Fisher's Ideal index is

(A) 117.3 (B) 115.43

(C) 118.35 (D) 116.48

Q29 Find the Paasche's index number for prices from the following data taking 1970 as the base year.

Commodity	1970		1975	
	Price	Quantity	Price	Quantity
A	1	6	3	5
B	3	5	8	5
C	4	8	10	6

(A) 261.36 (B) 265.48

(C) 274.32 (D) 282

Q30 If the 2018 index with base 2015 is 250 and 2015 index with base 2012 is 150, the index 2018 on base 2012 will be:

(A) 800 (B) 375

(C) 600 (D) None

Q31 The equations of two lines of regression are 4x + 3y + 7 = 0 and 3x + 4y + 8 = 0. Find the correlation coefficient between x and y.

(A) -0.75 (B) 0.25

(C) -0.92 (D) 1.25

Q32 If $\sum p_1q_1 = 249$, $\sum p_0q_0 = 150$, Paasche's Index Number $= 150$ and Dorbish and Bowely's Index number $= 145$, then the Fisher's Ideal Index Number is

(A) 175 (B) 144.91

(C) 145.97 (D) None

Q33 If Laspeyer's index is A and Fisher's index is B. Find the value of Passche's index.

(A) $\frac{B^2}{A}$ (B) $\frac{A^2}{B}$

(C) $\frac{A}{2B}$ (D) $\frac{2B}{A}$

Q34 If $\sum P_0Q_0 = 1360, \sum P_nQ_0 = 1900, \sum P_0Q_n = 1344, \sum P_nQ_n = 1880$, then the Laspeyre's Index number is

(A) 0.71 (B) 1.39

(C) 1.75 (D) None of these

Q35 If the slope of the regression line is calculated to be 5.5 and the intercept 15, then the value of Y when X is 6 is

(A) 88 (B) 48

(C) 18 (D) 78

Q36 Laspeyre index number is a weighted aggregate method by taking _____ as weights.

(A) Quantity consumed in the base year

(B) Quantity consumed in the current year

(C) Value of items consumed in base year

(D) Value of items consumed in the current year

Q37 If Y is dependent variable and X is independent variable and the S.D. of X and Y are 5 and 8 respectively and Co-efficient of co-relation between X and Y is 0.8. Find the Regression coefficient of Y on X.

(A) 0.78 (B) 1.28

(C) 6.8 (D) 0.32

Q38 Fisher index number is _____ of Laspyres and Paasches Index Number.

(A) A.M (B) G.M

(C) H.M (D) None of these

Q39 If $r = 0.28, \text{Cov}(x, y) = 7.6, V(x) = 9$ then $\sigma_y =$

(A) 8.75 (B) 9.04

(C) 6.25 (D) None

Q40 Which one is called an Ideal index number?

(A) Laspeyre's index number

(B) Paasche's index number

(C) Fisher's index number

(D) Masrshall Edgeworth index number

Q41 The cost-of-living index number in year 2015 and 2018 were 97.5 and 115 respectively. The salary of CA Jitendra in 2015 was 195000. How much additional salary was required for him in 2018 to maintain the same standard of living as in 2015 ?

(A) 30,000 (B) 40,000

(C) 35,000 (D) 45,000

Q42 Circular test is satisfied by which of the following index?

(A) Laspeyre's index

(B) Paasche's index

(C) Fisher's index

(D) Simple geometric mean of price relatives

Q43 For n pairs of observations, the coefficient of concurrent deviation is calculated as $\frac{1}{\sqrt{3}}$. if there are six concurrent deviations then n =

(A) 11 (B) 10

(C) 9 (D) 8

Q44 Which of the following statement is true?

(A) Paasche's Index number is based on the base year quantity

(B) Fisher's Index number is the arithmetic mean of Laspeyre's Index number and Paasche's Index numbers

(C) Arithmetic Mean is the most appropriate average for constructing the index number

(D) Fisher's Index number is an Ideal Index number

Q45 The simple index number for the current year using simple aggressive method for the following data:

Commodity base	Base year Price (P_0)	Current Year Price (P_1)
Wheat	80	100
Rice	100	150
Gram	120	250
Pulses	200	300

(A) 200 (B) 150
(C) 240 (D) 160

Q46 The regression equation of Y on X is, $2X + 3Y + 50 = 0$. The value of b_{YX} is
(A) $\frac{2}{3}$ (B) $-\frac{2}{3}$
(C) $-\frac{3}{2}$ (D) none

Q47 The cost of Index number is always
(A) Price Index number
(B) Quantity Index number
(C) Weighted Index number
(D) Value index number

Q48 If Laspeyre's Index number is 250 and Paasche's Index number is 160, then Fisher's Index number is
(A) 200 (B) 400
(C) 250 (D) 196

Q49 Paasche index is based on
(A) Base year quantities
(B) Current year's quantities
(C) Average of current and base year
(D) None of these

Q50 The coefficient of rank correlation between the ranking of following 6 students in two subjects Mathematics and Statistics is:

Mathematics	3	5	8	4	7	10
Statistics	6	4	9	8	1	2

(A) -0.26 (B) 0.35
(C) 0.38 (D) 0.20

Answer Key

Q1	(D)	Q26	(B)
Q2	(B)	Q27	(B)
Q3	(C)	Q28	(A)
Q4	(C)	Q29	(A)
Q5	(B)	Q30	(B)
Q6	(D)	Q31	(A)
Q7	(D)	Q32	(B)
Q8	(B)	Q33	(A)
Q9	(A)	Q34	(B)
Q10	(D)	Q35	(B)
Q11	(C)	Q36	(A)
Q12	(B)	Q37	(B)
Q13	(A)	Q38	(B)
Q14	(A)	Q39	(B)
Q15	(C)	Q40	(C)
Q16	(D)	Q41	(C)
Q17	(A)	Q42	(D)
Q18	(B)	Q43	(B)
Q19	(A)	Q44	(D)
Q20	(A)	Q45	(D)
Q21	(B)	Q46	(B)
Q22	(C)	Q47	(C)
Q23	(D)	Q48	(A)
Q24	(A)	Q49	(B)
Q25	(B)	Q50	(A)

Hints & Solutions

Q1 Text Solution:

We know that,

$r^2 = b_{xy} \times b_{yx}$

$\Rightarrow r^2 = 0.5 \times 0.45$

$\Rightarrow r^2 = 0.225$

$\Rightarrow r = \sqrt{0.225} = 0.47$

Q2 Text Solution:

Let the price of the base year (2005) be 100

Given as per the question,

Price of the current year $(2010) = 150$

Then, the percentage increase $= 150 - 100$

$= 50\%$

Q3 Text Solution:

According to the question,

As we know, there are 4 test of Adequacy which are written below:

1. Unit Test
2. Time Reversal Test
3. Factor Reversal Test
4. Circular Test

Thus, there are 4 test of Adequacy.

Hence, the correct option is (C).

Q4 Text Solution:

The two variables Shoe Size and Intelligence are completely different variables and are not related to each other.

As the shoe size increases, it has no relation with Intelligence of a person as the shoe size may or may not increase or decrease. The two variables are completely different. Thus it can be concluded that Shoe Size and Intelligence are not related and there exists no correlation.

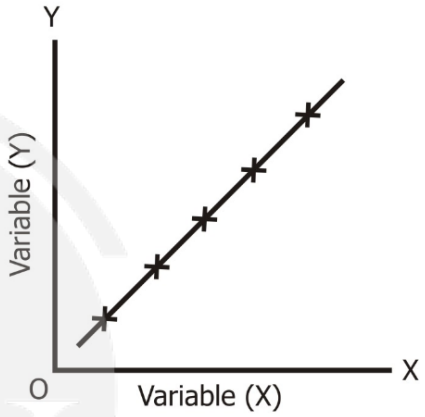
Hence, the correct answer is option (C) i.e., No Correlation.

Q5 Text Solution:

Fisher's index number does not satisfy **circular test**. The Fisher Price Index, also called the Fisher's Ideal Price Index, is a consumer price index (CPI) used to measure the price level of goods and services over a given period.

Hence, the correct option is (B) i.e. circular test.

Q6 Text Solution:



Scatter diagram does not help us to find the numerical value of correlation coefficient.

Scatter diagrams cannot give the exact extent of potential correlation. A scatter diagram does not show a quantitative measurement of the relationship between the variables.

Hence, the correct answer is option (D), i.e, find the numerical value of correlation coefficient.

Q7 Text Solution:

Given that ;

$b_{xy} = 0.4$

$b_{\mathrm{yx}} = 1.6$

We know that ,

Coefficient of determination ;

$\Rightarrow r^2 = b_{\mathrm{yx}} \times b_{\mathrm{xy}} = 1.6 \times 0.4 = 0.64$

Hence, the correct option is (D) i.e. 0.64.

Q8 Text Solution:

We know, in price index, when a new commodity is required to be added splicing price index is

used.

Q9 Text Solution:

As we know,

The time reversal test is a test to see if a particular approach will operate both forward and backward in time.

Fisher stated, "The test is that the method for calculating the index number should be such that it will produce the same ratio between one point of comparison and the other, regardless of which of the two is selected as base.

Thus, Circular test is an extension of time reversal test.

Hence, the correct option is (A) i.e., The time reversal test.

Q10 Text Solution:

Given,

$\Sigma P_1 Q_1 = 100,\ \Sigma P_0 Q_1 = 86,\ \Sigma P_0 Q_0 = 83,\ \Sigma P_1 Q_0 = 106$

We know,

Laspeyre's index is given by $\frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times 100$

$= \frac{106}{83} \times 100$

$= 127.71$

Q11 Text Solution:

Given equation: 2x + 3y + 1 = 0 and 5x + 6y + 1 = 0

Multiplying the first eq with 2 and subtracting from the second eq., we get

$5x + 6y + 1 - (4x + 6y + 2) = 0$

$\Rightarrow 5x + 6y + 1 - 4x - 6y - 2 = 0$

$\Rightarrow x - 1 = 0$

$\Rightarrow x = 1$

$\Rightarrow 2(1) + 3y + 1 = 0$

$\Rightarrow y = -1$

Since, regression lines intersect at mean

Therefore, the mean of x and y are 1 and -1 respectively.

Q12 Text Solution:

Given ;

$n = 10$

$\Sigma d^2 = 22$

We know that,

Coefficient of Rank Correlation

$R = 1 - \frac{6\ \Sigma d^2}{n(n^2-1)}$

$= 1 - \frac{6\times 22}{10(10^2-1)}$

$= 1 - \frac{6\times 22}{10\times 99}$

$= 1 - \frac{132}{990}$

$= \frac{858}{990}$

$= 0.867\ (approx)$

Hence, the correct option is (B).

Q13 Text Solution:

When the prices for quantities consumed of all commodities are changing in the same ratio, then the index numbers due to Laspeyre's and Paasche's will be equal.

Hence, the correct option is (A) i.e. Equal .

Q14 Text Solution:

Here, $D^2 = 30,\ N = 10$

Spearman's rank correlation is;

$R = 1 - \frac{6\Sigma D^2}{N(N^2-1)}$

$= 1 - \frac{6\times 30}{10(10^2-1)}$

$= 1 - \frac{180}{990}$

$= 1 - \frac{2}{11}$

$= \frac{9}{11} = 0.82$

Therefore, $R = 0.82$

Hence, the correct option is (A).

Q15 Text Solution:

We know that,

Fisher's index number is called as ideal index number because it satisfies both factor and time reversal test.

Q16 Text Solution:

According to the question,

Commodity	A	B	C	D	E	
Price in 2011 (P_0)	115	108	95	80	90	$\Sigma P_0 = 488$
Price in 2012 (P_1)	125	117	108	95	95	$\Sigma P_1 = 540$

As we know,

Price relative is formulated as,

$$\text{Price Relative } = P_{01} = \frac{\Sigma P_1}{\sum P_0} \times 100$$
$$= \frac{540}{488} \times 100$$
$$= 110.655 \approx 111$$

Hence, the correct option is (D).

Q17 Text Solution:

We know,

Circular test is satisfied

when $P_{01} \times P_{12} \times P_{20} = 1.$

Q18 Text Solution:

Spearman's rank correlation coefficient is denoted by r

$r = 1 - \frac{6\Sigma d^2}{n(n^2-1)}$

Where ;

(d) = difference between rank of paired items of x and y variables

$\sum d^2$ = Total of squares of rank differences

n = number of pairs of items

Given

$\Sigma d^2 = 50$

$n = 8$

We know that, Coefficient of rank correlation

$r = 1 - \frac{6\Sigma d^2}{n(n^2-1)}$

$= 1 - \frac{6\times 50}{8(8^2-1)}$

$= 1 - \frac{300}{450} = 0.40$

Hence, the correct option is (B).

Q19 Text Solution:

Given: $U = \frac{X-5}{10}$ and $V = \frac{Y-7}{2}$

$\Rightarrow U = \frac{X}{10} - \frac{5}{10}$ and $V = \frac{Y}{2} - \frac{7}{2}$

Thus, $a = \frac{1}{10}$ and $b = \frac{1}{2}$

Therefore, $r_{uv} = \frac{a\times b}{|a\times b|} \times r_{xy}$

$\Rightarrow r_{uv} = \frac{\frac{1}{10}\times\frac{1}{2}}{\left|\frac{1}{10}\times\frac{1}{2}\right|} \times r_{xy}$

$\Rightarrow r_{uv} = r_{xy} = r$

Hence, the correct option is (A).

Q20 Text Solution:

Given: Bowley's Index number = 150, Laspeyre's Index number = 180

We know that,

Bowley's index $= \frac{Laspeyre's\ index + Paasche's\ index}{2}$

$\Rightarrow 150 = \frac{180+P}{2}$

$\Rightarrow 300 = 180 + P$

$\Rightarrow P = 120$

Q21 Text Solution:

As we know,

P_{10} is the index for time 0 on 1.

Hence, the correct answer is option (B).

Q22 Text Solution:

According to the question,

Let the price index over base year be 100,

Now, The percentage increase will be given as,

= Current Year - Base year

= (267 - 100)%

= 167%

Hence, the correct option is (C) i.e., 167%.

Q23 Text Solution:

We know that,

Laspeyre's index

$= \frac{\sum P_1Q_0}{\sum P_0Q_0} \times 100$

$= \frac{106}{83} \times 100$

$= 127.71$

Q24 Text Solution:

We know that,

Retail Price index is a list of the prices of typical goods and it shows how much the cost of living changes from month to month.

Q25 Text Solution:

We know,

$$Fisher's\ index$$
$$= \sqrt{Laspeyre's \times Paasche's}$$
$$\Rightarrow 150 = \sqrt{Laspeyre's \times 144}$$
$$\Rightarrow (150)^2 = Laspeyre's \times 144$$
$$\Rightarrow Laspeyre's = \frac{(150)^2}{144}$$
$$\Rightarrow Laspeyre's = 156.25$$

Q26 Text Solution:

We know,

In price index, when a new commodity is required to be added, Splicing price index is used.

Q27 Text Solution:

Let height of father be x and that of son be y. To find the regression equation y on x, we will find b_{yx}.

For that we prepare the table as follows:

Height of father x	Height of son y	$u = x - 171$	$v = y - 172$	uv	u^2
175	173	4	1	4	16
172	172	1	0	0	1
167	171	− 4	− 1	4	16
168	171	− 3	− 1	3	9
172	173	1	1	1	1
171	170	0	− 2	0	0
174	173	3	1	3	9
176	175	5	3	15	25
169	170	− 2	− 2	4	4
170	173	− 1	1	− 1	1
(Σx_i) = 1714	(Σy_i) = 1721	(Σu) = 4	(Σu) = 1	(Σuv) = 33	(Σu^2) = 82

Here,

$$\bar{x} = \frac{\sum x_i}{N} = \frac{1714}{10} = 171.4$$
$$\bar{y} = \frac{\sum y_i}{N} = \frac{1721}{10} = 172.1$$
$$b_{yx} = \frac{N\sum uv - \Sigma u \Sigma v}{N\sum u_i^2 - (\Sigma u)^2}$$
$$= \frac{10(33) - 4(1)}{10(82) - (4)^2} = \frac{326}{804}$$
$$= 0.4054$$

Thus, regression equation y on x is given by

$$y - \bar{y} = b_{yx}(x - \bar{x})$$
$$\Rightarrow y - 172.1 = 0.4054(x - 171.4)$$
$$\Rightarrow a = 172.1 + 0.4054x - 69.48556$$
$$\Rightarrow a = 0.4054x + 102.60$$

Thus, the regression equation y on x is

$$y = 102.60 + 0.4054x$$

Hence, the correct option is (B).

Q28 Text Solution:

According to the question,

Make a data table according to the question,

Commodity	P_0	Q_0	P_1	Q_1	P_0Q_0	P_1Q_0	P_0Q_1	P_1Q_1
A	4	3	6	2	12	18	8	12
B	5	4	6	4	20	24	20	24
C	7	2	9	2	14	18	14	18
D	2	3	1	5	6	3	10	5
					ΣP_0Q_0 = 52	ΣP_1Q_0 = 63	ΣP_0Q_1 = 52	ΣP_1Q_1 = 59

Fisher's Ideal index is given by the formula,

Fisher's Index Number

$$= \sqrt{\frac{\sum P_1Q_0 \times \sum P_1Q_1}{\sum P_0Q_0 \times \sum P_0Q_1}} \times 100$$
$$= \sqrt{\frac{63 \times 59}{52 \times 52}} \times 100$$
$$= 117.244 = 117.3\ (approx.)$$

Hence, the correct answer is option (A).

Q29 Text Solution:

Make a data table according to the question,

Commodity	p_0	q_0	p_1	q_1	p_1q_1	p_0q_1
A	1	6	3	5	15	5
B	3	5	8	5	40	15
C	4	8	10	6	60	24
					$\Sigma p_1q_1 = 115$	$\Sigma p_0q_1 = 44$

Paasche's index number is given by the formula,

$= \frac{\sum P_1Q_1}{\sum P_0Q_1} \times 100$

$= \frac{115}{44} \times 100$

$= 261.36$

Q30 Text Solution:

Given,

If the 2018 index with base 2015 = 250 and 2015 index with base 2012 = 150

To find: The index 2018 on base 2012

Using chain base index:

Year	Index	Chain Base Index
2012	100	100
2015	150	$\frac{150\times100}{100} = 150$
2018	250	$\frac{250\times150}{100} = 375$

'Or'

Index 2018 on base 2012, $P_{20} = \frac{P_{21}\times P_{10}}{100}$

$\Rightarrow \frac{250\times150}{100}$

$\Rightarrow 375$

Therefore, the index 2018 on base 2012 will be 375.

Q31 Text Solution:

Given equations of two lines of regression are 4x + 3y + 7 = 0 and 3x + 4y + 8 = 0

$\Rightarrow 4x = -3y - 7$

$\Rightarrow x = -\frac{3y}{4} - \frac{7}{4}$

$\Rightarrow b_{xy} = -\frac{3}{4}$

$Also,\ 4y = -3x - 8$

$\Rightarrow y = -\frac{3x}{4} - 2$

$\Rightarrow b_{yx} = -\frac{3}{4}$

Clearly,

$b_{xy}.b_{yx} = \left(-\frac{3}{4}\right)\left(-\frac{3}{4}\right) = \frac{9}{16} < 1$

We know,

$r^2 = b_{xy}.b_{yx}$

$\Rightarrow r^2 = \frac{9}{16}$

$\Rightarrow r = -\frac{3}{4} = -0.75$

(Since, both regression coefficent are negative)

Q32 Text Solution:

We know,

Dorbish and Bowely's Index number $= \frac{Laspeyre's\ \text{in}\ dex + Paasche's\ index}{2}$

$\Rightarrow 145 = \frac{L+150}{2}$

$\Rightarrow 290 = L + 150$

$\Rightarrow L = 140$

Also,

$Fisher's\ index$

$= \sqrt{Laspeyre's\ index \times Paasche's\ index}$

$\Rightarrow Fisher's\ index = \sqrt{140 \times 150}$

$\Rightarrow Fisher's\ index = 144.91$

Q33 Text Solution:

Given, Laspeyer's index = A and Fisher's index = B

We know,

$Fisher's\ Index$

$= \sqrt{Laspeyre's \times Passche's}$

$\Rightarrow B = \sqrt{A \times Passche's}$

$\Rightarrow B^2 = A \times Passche's$

$\Rightarrow Passche's\ Index = \frac{B^2}{A}$

Q34 Text Solution:

As we know, Laspeyre's Index number is

formulated as,

Laspeyre's Index number $= \frac{\sum P_n Q_0}{\sum P_0 Q_0}$

$= \frac{1900}{1360}$

$= 1.3970 \approx 1.39$

Hence, the correct option is (B).

Q35 Text Solution:

Given,

Slope $= 5.5$

Intercept $= 15$

We know that,

Regression equation Y on X is $Y = a + bX$

where,

$a = Y$-intercept $= \ 15$

$b =$ Slope $= \ 5.5$

Therefore, Regression equation Y on X is

$Y = 15 \ + \ 5.5X$

When X is 6 then $Y = 15 + \ 5.5\,(6)$

$\Rightarrow Y = \ 48$

Hence, the correct option is (B).

Q36 Text Solution:

We know that,

Laspeyre index number is a weighted aggregate method by taking quantity consumed in the base year as weights.

Q37 Text Solution:

According to the question, we have

$\sigma_x = 5, \ \sigma_y = 8 \ \& \ r = 0.8$

Thus, the Regression coefficient of Y on X is given by:

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

$\Rightarrow b_{yx} = 0.8 \times \frac{8}{5}$

$\Rightarrow b_{yx} = 1.28$

Q38 Text Solution:

We know,

$Fisher's \ index$

$= \sqrt{Laspeyre's \ Index \times Paasche's \ index}$

Therefore, Fisher index number is geometric mean of Laspyres and Paasches Index Number.

Q39 Text Solution:

We know that,

$r = \frac{\mathrm{Cov}(x,y)}{\sigma_x \sigma_y}$

Given $r = 0.28, \mathrm{Cov}(x,y) = 7.6, V(x) = 9$

Thus, $\sigma_x = 3$

$\Rightarrow 0.28 = \frac{7.6}{3\sigma_y}$

$\Rightarrow \sigma_y = 9.04$

Hence, option (B) is correct i.e. 9.04 .

Q40 Text Solution:

As we know, The Paasche and Laspeyre's index numbers are combined to create the Fisher index, which is the square root of that product.

Fisher's ideal index

numbe

r= $\sqrt{\text{Paasche index number} \times \text{Laspeyre's}}$

Thus, Fisher's Index number is an Ideal Index Number.

Hence, the correct option is (C) i.e., Fisher's index number.

Q41 Text Solution:

Let the salary of CA Jitendra in 2018 be x, then

According to the question

Year	Cost of living Index	Income
2015	97.5	1,95,000
2018	115	x

Thus,

$\frac{97.5}{115} = \frac{195000}{x}$

$\Rightarrow x = \frac{195000 \times 115}{97.5}$

$\Rightarrow x = 2,30,000$

Therefore, the additional salary required = 2,30,000 - 1,95,000 = 35,000

Q42 Text Solution:

We know, Circular test is not satiesfied by laspeyre's, Paasche's or Fisher's Index but satisfied by simple geometric mean of price relatives.

Q43 Text Solution:

We know that,

$r_c = \sqrt{\frac{2c-m}{m}}$

$\Rightarrow \frac{1}{\sqrt{3}} = \sqrt{\frac{2(6)-m}{m}}$

$\Rightarrow \frac{1}{\sqrt{3}} = \sqrt{\frac{12-m}{m}}$

$\Rightarrow \frac{1}{3} = \frac{12-m}{m}$

$\Rightarrow m = 36 - 3m$

$\Rightarrow 4m = 36$

$\Rightarrow m = 9$

$Thus,\ n\ =\ m + 1 = 9 + 1 = 10$

Q44 Text Solution:

As we know,

The Paasche and Laspeyre's index numbers are combined to create the Fisher index, which is the square root of that product.

Fisher's ideal index number

$= \sqrt{Paasche\ index\ number\ \times\ Laspeyre's\ index\ number}$

Therefore, the statement which is true is Fisher's Index number is an Ideal Index Number.

Hence, the correct option is (D) i.e., Fisher's Index number is an Ideal Index Number.

Q45 Text Solution:

The simple Aggregative Index is given by the formula,

$\frac{\sum P_1}{\sum P_0} \times 100$

$= \frac{100+150+250+300}{80+100+120+200} \times 100$

$= \frac{800}{500} \times 100$

$= 160$

Q46 Text Solution:

According to the question,

$2X + 3Y + 50 = 0$

$\Rightarrow 3Y = -50 - 2X$

$\Rightarrow Y = \left(\frac{-2}{3}\right)X - \frac{50}{3}$

Thus, $b_{YX} = \left(\frac{-2}{3}\right)$

Hence, the correct option is (B).

Q47 Text Solution:

We know,

The cost of Index number is always a weighted index number.

Q48 Text Solution:

Given, Laspeyre's Index number = 250 and Paasche's Index number = 160

We know,

$Fisher's\ Index = \sqrt{250 \times 160}$

$\Rightarrow Fisher's\ Index = 5 \times 4 \times 10$

$\Rightarrow Fisher's\ Index = 200$

Q49 Text Solution:

As we know, Paasche's index is a price composite index produced using the weighted sum method.

This index number represents the ratio between the total price for the actual period and the total price for the reference period, with the actual period's real relative quantities used to weight the sums.

Hence, the correct answer is option (B) i.e., Current year's quantities.

Q50 Text Solution:

According to the given data, we have

Mathematics	R_1	Statistics	R_2	$d = R_1 - R_2$	d^2
3	6	6	3	3	9
5	4	4	4	0	0
8	2	9	1	1	1
4	5	8	2	3	9
7	3	1	6	-3	9
10	1	2	5	-4	16
					$\sum d^2 = 44$

Thus, the coefficient of rank correlation is given

by:

$$R = 1 - \frac{\sum d^2}{n(n^2-1)}$$
$$= 1 - \frac{6\times 44}{6\times 35}$$
$$= 1 - \frac{44}{35}$$
$$= -0.26 \left(approx \right)$$