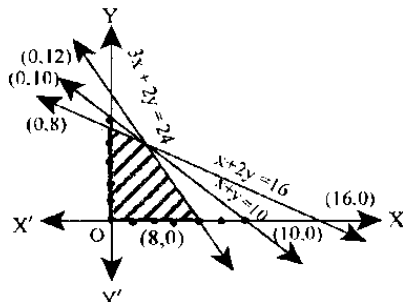


PAPER 3 : QUANTITATIVE APTITUDE

1. The shaded region represents:



- (a) $3x + 2y \leq 24, x + 2y \geq 16, x + y \leq 10, x \geq 0, y \geq 0,$
 (b) $3x + 2y \leq 24, x + 2y \leq 16, x + y \geq 10, x \geq 0, y \geq 0$
 (c) $3x + 2y \leq 24, x + 2y \leq 16, x + y \leq 10, x \geq 0, y \geq 0$
 (d) None
2. $a^x = b^y = c^z$ and $b^2 = ac$ then y is equal to -
- (a) $\frac{xy}{x+z}$
 (b) $\frac{xy}{2(x-z)}$
 (c) $\frac{xz}{2(z-x)}$
 (d) $\frac{2xz}{(x+z)}$
3. Find out the value of m if roots of the equation $x^2 + 2mx + 1 = 0$ are equal in magnitude and opposite in sign.
- (a) 1
 (b) -1
 (c) 0
 (d) None of these
4. What is the sum of the squares of the roots of equation $x^2 + 2x - 143 = 0$?
- (a) 170
 (b) 180
 (c) 190
 (d) 290

5. If Rs. 510 be divided among A, B, C in such a way that A gets $\frac{2}{3}$ of what B gets and B gets $\frac{1}{4}$ of what C gets, then the share of A ?
- (a) Rs. 60
(b) Rs. 50
(c) Rs. 150
(d) Rs. 200
6. There are 5 letters and 5 directed envelopes Find the number of ways in which the letters can be put into the envelopes so that all are not put in directed envelopes
- (a) 129
(b) 119
(c) 109
(d) 139
7. Calculate the sum of infinite geometric progression 1, -3, 9, -27,----- ∞ :
- (a) $\frac{1}{4}$
(b) $\frac{3}{4}$
(c) $-\frac{1}{4}$
(d) does not exist
8. If the n th term of an arithmetic progression is $(2n-1)$, then what is the sum upto n terms ?
- (a) n^2-1
(b) n^2+1
(c) $\frac{1}{2}n(n+1)$
(d) n^2
9. Sum of all natural number till 300 which are not divisible by 3
- (a) 45150
(b) 15150
(c) 30000
(d) 29700
10. In a group of 75 persons, 20 take tea but not coffee and 30 take tea. How many take coffee but not tea?
- (a) 45
(b) 35
(c) 40
(d) 18

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11. In a football championship 153 matches were played. Every team played one match with each other team. How many teams participated in the championship ?
 (a) 21
 (b) 18
 (c) 17
 (d) 15
12. If $f(x) = (x+1)$ and $g(x) = 3x^2-2$, find the value of $g \circ f(x) = ?$
 (a) $3x^2+6x+1$
 (b) $2x^2-6x+3$
 (c) $3x^2-5$
 (d) $x-5$
13. 10 examination papers are arranged in such a way that the best and worst papers never come together. The number of arrangements is
 (a) $9 \times 8!$
 (b) $10!$
 (c) $8 \times 9!$
 (d) none of these
14. There are 7 routes from station X to station Y. In how many ways one may go from X to Y and return, if for returning one can make a choice of any of the routes?
 (a) 49
 (b) 17
 (c) 42
 (d) 35
15. In how many ways can 5 persons be seated at a round table if 2 particular persons sit together
 (a) 24
 (b) 6
 (c) 12
 (d) None of these
16. The gradient of the curve $y = 2x^3 - 3x^2 - 12x + 8$ at $x = 0$ is :-
 (a) -12
 (b) 12
 (c) 0
 (d) None
17. $\int (e^{3\log x} + e^{x\log 3}) dx$
 (a) $\frac{x^4}{4} + \frac{3^x}{\log 3} + C$
 (b) $\frac{x^4}{4} + 3^x \log 3 + C$
 (c) $\frac{1}{4} e^{3\log x} + \frac{1}{3} e^{x\log 3} + C$
 (d) None

18. How much amount is required to be invested every years as to accumulate Rs. 7,96,870 at the end of 10 years, if interest compounded annually at 10% given that $A(10,0.1) = 15.9374$?
- Rs. 40,000
 - Rs. 45,000
 - Rs. 48,000
 - Rs. 50,000
19. If $A = \{1,2,3\}$ and $R = \{(1,1), (2,2), (3,3), (1,2), (2,1), (2,3), (3,2)\}$ is a relation on A, then which one of the following is correct?
- R is reflexive, symmetric and transitive
 - R is reflexive, symmetric but not transitive
 - R is reflexive, transitive but not symmetric
 - R is reflexive, but neither symmetric nor transitive
20. Solve: $\frac{3x-4}{2} \geq \frac{x+1}{4} - 1$
- $x \geq 8$
 - $x \leq 8$
 - $x \geq 1$
 - $x \leq 1$
21. If $A = \{2,3\}$, $B = \{4,5\}$, $C = \{5,6\}$ then $(A \times B) \cup (B \times C)$ is:-
- $\{(2,4), (2,5), (2,6), (3,4), (3,5), (3,6)\}$
 - $\{(2,5), (3,5)\}$
 - $\{(2,4), (2,5), (3,4), (4,5), (3,5), (4,6), (5,5), (5,6)\}$
 - None
22. If $\frac{1}{\log_a^t} + \frac{1}{\log_b^t} + \frac{1}{\log_c^t} = \frac{1}{\log_z^t}$ then the value of Z.
- abc
 - a+b+c
 - a(b+c)
 - (a+b)c
23. If $\log_{10} 2 = x$ and $\log_{10} 4 = y$, then $\log_{10} 80$ is equal to:
- $x - y + 1$
 - $x + y + 1$
 - $x - y - 1$
 - $2x - y + 1$

24. If $f(x) = {}^x C_2$, then $f'(3)$ is equal to:-

- (a) $-\frac{5}{2}$
- (b) $-\frac{2}{5}$
- (c) $\frac{5}{2}$
- (d) $\frac{2}{5}$

25. $\lim_{x \rightarrow c} \frac{(x+2)^{3/2} - (c+2)^{3/2}}{x-c}$

- (a) c
- (b) $\frac{1}{c}$
- (c) 0
- (d) None

26. $\lim_{x \rightarrow 1} \frac{e^{-x} - e^{-1}}{x-1}$

- (a) e
- (b) $\frac{-1}{e}$
- (c) $\frac{1}{e}$
- (d) 0

27. The roots of the equation $x^3 - 3x^2 - 4x + 12 = 0$ has three real roots. They one:

- (a) $-2, 2, 3$
- (b) $-2, -2, 3$
- (c) $2, -2, -3$
- (d) $-2, 2, -3$

28. The sum of two numbers is 75 and their difference is 25. The product of the two numbers is :-

- (a) 1350
- (b) 1250
- (c) 125
- (d) 1000

29. Find two numbers such that their mean proportional is 6 and third proportional 20.25
(a) 4 and 9
(b) 16 and 25
(c) 4 and 16
(d) 9 and 16
30. A certain sum amounted to Rs. 575 at 5% in a time in which Rs. 750 amounted to Rs. 840 at 4%. If the rate of interest is simple. Find the sum :-
(a) 525
(b) 550
(c) 515
(d) 500
31. In simple interest if the principal is Rs. 2000 and the rate and time are the roots of the equation $x^2 - 5x + 6 = 0$ then the simple interest is:-
(a) Rs. 240
(b) Rs. 120
(c) Rs. 90
(d) None
32. The difference in simple interest of a sum invested of Rs. 1500 for 3 years is Rs. 9. The difference in their rates is:-
(a) 0.40
(b) 0.60
(c) 0.20
(d) 0.10
33. If the initial investment of Rs. 40,000 becomes Rs. 60,000 in 24 months, then the compound annual growth rate is:-
(a) 30.33%
(b) 22.47%
(c) 19.46%
(d) 14.47%
34. A sum is invested in a term deposit scheme that fetches interest 6% p.a. compounded quarterly. Then find the effective rate of interest?
(a) 6.09%
(b) 6.03%
(c) 6.08%
(d) 6.13%
35. The population of city increases at rate 5% every year. What will be the population of the city in the year 2023, if its population in 2021 was 1,20,000?
(a) 1,32,303
(b) 1,32,300
(c) 1,35,400
(d) 1,40,000
36. In CI a certain sum of money double itself in 4 years. In how much time the sum becomes 64 times itself?
(a) 20 years
(b) 16 years
(c) 24 years
(d) 18 years

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37. What is the present value of an investment that pays ₹ 400 at the end of 3 years and ₹ 500 at the end of 6 years?
- 320
 - 335
 - 340
 - 280
38. A person invests in a fund that pays 4% per annum for 4 years. The future value of Current ₹ 4000 would be :-
- ₹ 3419
 - ₹ 4679
 - ₹ 4866
 - ₹ 3287
39. If a loan of ₹ 30,000 is to be paid in 5 annual instalments with interest rate of 14% per annum, then the equal annual instalment will be _____
 $P(5, 0.014) = 3.43305$
- ₹ 7400
 - ₹ 8100
 - ₹ 8738
 - ₹ 8322
40. Rs. 800 is investment at the end of each month in an account paying interest 6% per year compounded monthly. What is the future value of this annuity after 10th payment? Given that $(1.005)^{10} = 1.0511$
- ₹ 4444
 - ₹ 8766
 - ₹ 3491
 - ₹ 8176
41. Suresh's sister is the wife of Ram. Ram is Rani's brother. Ram's father is Madhur. Sheetal is Ram's grandmother. Rema is Sheetal's daughter-in-law. Rohit is Rani's brother's son. Who is Rohit to Suresh ?
- Brother-in-law
 - Son
 - Brother
 - Nephew

Directions (Q. 42-43):

Following questions are based on the information provided below:

- 'P x Q' means 'P is brother of Q.'
 - 'P ÷ Q' means 'P is sister of Q.'
 - 'P + Q' means 'P is mother of Q.'
 - 'P - Q' means 'P is father of Q.'
42. Which of the following means 'D is maternal uncle of T' ?
- $D \times J + T$
 - $D \times J - T$
 - $D \div J + T$
 - $D \div J - T$

43. Which of the following means 'R is granddaughter of B' ?
(a) $R \div M + K - B$
(b) $K + M \div R - B$
(c) $B - T + R \div D$
(d) $B - T + R$
44. Pointing to a lady, suresh said "she is the mother of my son's wife's daughter. How suresh related to lady?
(a) Uncle
(b) Cousin
(c) Daughter-in-law
(d) Father-in-law
45. Showing the man playing the cricket, Ms. P said, 'He is the brother of my uncle's daughter". Who is the man to Ms. P?
(a) Son
(b) Cousin
(c) Uncle
(d) Brother-in-law

Directions (Q. Nos. 46) Read the following information carefully and then answer the questions that follow.

Five plays A, B, C, D and E were organised in a week from Monday to Saturday with one play each day and no play was organised on one of these days. Play D was organised before Thursday but after Monday. Play E was organised on Saturday. Play C was not organised on the first day. Play B was organised on the next day on which play C was organised. Play A was organised on Tuesday.

46. On which day was no play organised ?
(a) Monday
(b) Wednesday
(c) Thursday
(d) Friday
47. Six person are sitting in a circle facing the center. Parikh is between Bablu and Narendra; Ashok is between Chitra and Pankaj. Chitra is on the immediate left of Bablu. Who is on the immediate right of Bablu?
(a) Parikh
(b) Pankaj
(c) Narendra
(d) Chitra
48. Five girls G, H, I, J, K are sitting in a row facing South not necessarily in the same order H is sitting between G and K, I is immediate right to K, J is immediate left to G. Which of the following is true?
(a) J is third to the left of K
(b) G is second of the left of I
(c) H is to the right of K
(d) H is to the left of G

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49. A, B, C, D, E, F and G are sitting in a row facing north:
1. F is to the immediate right of E.
 2. E is 4th to the right of G.
 3. C is the neighbor of B and D.
 4. Person who is third to the left of D is at one of ends.
- Who are to the right of D?
- (a) E and F & A
 - (b) G, B and C
 - (c) C, B and E
 - (d) G and B only
50. In a line, P is sitting 14th from left. Q is sitting 22nd from the right and 3rd left from P. How many people are sitting in the line?
- (a) 34
 - (b) 31
 - (c) 32
 - (d) 33
51. Raju is Ramu's neighbour and he stays 100 metres away towards southeast. Rahul is Raju's neighbour and he stays 100 metres away towards southwest. Bhagesh is Rahul's neighbour and he stays 100 metres away towards, north-west. Then where is the position of Bhagesh's home in relation to Ramu's?
- (a) South-East
 - (b) South-West
 - (c) North-West
 - (d) East
52. A man is facing west he turns 45 degrees in the clockwise direction and then another 180 degrees in the same direction and then 270 degrees in the anticlockwise direction. Which direction is he facing now?
- (a) South-west
 - (b) North-west
 - (c) West
 - (d) South
53. A man can walk by having long, medium and short steps. He can cover 60 meters by 100 long steps, 100 meters by 200 medium steps and 80 meters by 200 short steps, he starts walking by 6000 long steps then he turns left and walk by taking 6000 medium steps. He then turns left and walk by taking 1500 short steps. How far (in meters) is he away from his starting point?
- (a) 5000 m
 - (b) 4243 m
 - (c) 6000 m
 - (d) 7000 m
54. One morning after Sunrise, Vikram and Shailesh were standing in a down with their back towards each other. Vikram's shadow fell exactly towards left hand side. Which direction was Shailesh facing?
- (a) South-West
 - (b) West
 - (c) South
 - (d) East-South

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55. If $P \times Q$ means P is to the south of Q ; $P + Q$ means P is to the north of Q ; $P \% Q$ means P is to the east of Q ; $P - Q$ means P is to the west of Q : then in case of $A \% B + C - D$, Dis in which direction with respect to B ?
- North-west
 - South-east
 - North-east
 - South-west
56. Find next number in the given series?
 11, 17, 39, 85, ? 281, 447
- 153
 - 143
 - 133
 - 163
57. Find next number in the given series?
 0, 4, 18, 48, 100, ?
- 144
 - 156
 - 180
 - 196
58. In a certain code DATE is written as $\# \% \$ @$ and STYLE is written as $* \$ @ \uparrow @$. How is DELAY written in that code?
- $\# @ \uparrow \% @$
 - $\# @ \$ \% @$
 - $\# @ \$ \% @$
 - $\# \$ \uparrow \% @$
59. In a certain code language, 'go and come' is written as 'na ta ka' and 'black and white' is written as 'pa ma ta'. How is 'go' written in that code language?
- na
 - ka
 - pa
 - na or ka
60. If 'M' denotes ' $\times$ ', 'R' denotes ' $-$ ', 'k' denotes ' $+$ ' and 'B' denotes ' $\div$ ', then –
 $24 B 4 M 8 K 6 R 4 ?$
- $-3\frac{4}{7}$
 - $-3\frac{1}{4}$
 - 52
 - 50
61. Which of the following diagram is the most appropriate to represents various heads in total cost?
- Pie chart
 - Bar graph
 - Multiple line chart
 - Scatter plot

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62. A student marks in five subject S_1, S_2, S_3, S_4 and S_5 are 86, 79, 90, 88 and 89. If we need to draw a Pie chart to represent these marks, then what will be the Central angle for S_3 ?
- 103.2°
 - 75°
 - 105.6°
 - 94.8°
63. Which one of the following is not a mode of presentation of data?
- Textual presentation
 - Tabular presentation
 - External presentation
 - Diagrammatic representation
64. Consider the following data where class length is given as 5. Calculate the number of class intervals.
 59, 68, 78, 57, 44, 73, 40, 60, 70, 47.
- 5
 - 6
 - 7
 - 8
65. The Law of Statistical Regularity says that
- Sample drawn from the population under discussion possesses the characteristics of the population
 - A large sample drawn at random from the population would possess the characteristics of the population
 - A large sample drawn at random from the population would possess the characteristics of the population on an average
 - An optimum level of efficiency can be attained at a minimum cost.
66. Sampling Fluctuations may be described as
- The variation in the values of a statistic
 - The variation in the values of a sample
 - The differences in the values of a parameter
 - The variation in the values of observations.
67. The number of factors must be known are _____ in determining the sample size for estimating a population mean.
- 2
 - 5
 - 4
 - 3
68. The permissible sampling error is required to determine sample size for
- estimating a proportion
 - estimating a Mean
 - Both (a) & (b)
 - None of these

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69. Given the following observations arranged in ascending order with median = 22. Find the value of n.
 11, 13, 15, 19, n + 2, n + 4, 30, 35, 39, 46
 (a) 19
 (b) 20
 (c) 25
 (d) 30
70. If the Arithmetic mean between two numbers is 64 and the Geometric mean between them is 16. The Harmonic Mean between them is _____.
 (a) 64
 (b) 4
 (c) 16
 (d) 40
71. There were 50 students in a class. 10 failed whose average marks were 2.5. The total marks of class were 261. Find the average marks of students who passed?
 (a) 6.4
 (b) 5.9
 (c) 6.0
 (d) 8.6
72. Find the mode of the following distribution?
- | | | | | | | | |
|-----------|-----|------|-------|-------|-------|-------|-------|
| Class : | 0-7 | 7-14 | 14-21 | 21-28 | 28-35 | 35-42 | 42-49 |
| Frequency | 19 | 25 | 36 | 72 | 51 | 43 | 28 |
- (a) 24.3
 (b) 25.4
 (c) 72
 (d) 21
73. If there are two groups with n_1 and n_2 observations and H_1 and H_2 are respective harmonic means, then the harmonic mean of combined observation is
 (a) $\frac{n_1 H_1 + n_2 H_2}{n_1 + n_2}$
 (b) $\frac{n_1 H_1 + n_2 H_2}{H_1 + H_2}$
 (c) $\frac{n_1 + n_2}{n_1 H_1 + n_2 H_2}$
 (d) $\frac{(n_1 + n_2) \times H_1 H_2}{n_1 H_2 + n_2 H_1}$
74. If mean and median of moderately asymmetrical series are 26.8 and 27.9 respectively then most probable value of mode is
 (a) 35.4
 (b) 30.1
 (c) 34.3
 (d) 70.8

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75. If two variables x and y are related by $2x + 3y - 7 = 0$. The mean and mean deviation about mean of x are 1 and 0.6 respectively then the coefficient of mean deviation of y about mean is.
- 12
 - 4
 - 24
 - 50
76. Compute the SD of 9, 5, 8, 6, 2
 Without any more computation, obtain the SD of
- | | | | | | |
|------------|-----|-----|-----|-----|-----|
| Sample I | -1, | -5, | -2, | -4, | -8, |
| Sample II | 90, | 50, | 80, | 60, | 20, |
| Sample III | 23, | 15, | 21, | 17, | 9, |
- 2.45, 3.45, 2.90
 - 2.45, 12.45, 4.90
 - 2.45, 24.50, 4.90
 - 2.45, 2.45, 4.90
77. The mean and variance of 5 observations are 4.80 and 6.16 respectively. If three of the observations are 2, 3 and 6, what are the remaining observations?
- 5,0
 - 4,9
 - 11,3
 - 6,7
78. 1st quartile is 142, Semi-inter quartile range is 18. Then median is
- 151
 - 160
 - 178
 - None
79. The second and third moments of a sample of seven observation (-6, -4, -2, 0, 2, 4, 6) are
- (12, 0)
 - (0, 12)
 - (0, 16)
 - (16,0)
80. A number is selected at random from the first 100 natural numbers. What is the probability that it would be a multiple of 3 or 7 ?
- $\frac{33}{100}$
 - $\frac{4}{100}$
 - $\frac{21}{100}$
 - $\frac{43}{100}$

81. If $(A \cup B) = 0.8$ and $P(A \cap B) = 0.3$ then $P(\bar{A}) + P(\bar{B})$ is equal to:

- (a) 0.3
- (b) 0.5
- (c) 0.9
- (d) 0.7

82. The probability distribution of a random variable x is given below:

X:	1	2	4	5	6
P:	0.15	0.25	0.2	0.3	0.1

What is the standard deviation of x ?

- (a) 1.49
- (b) 1.56
- (c) 1.69
- (d) 1.72

83. The odds in favour of an event A is 2 : 3 and odds against an event B is 6: 4 the probability that only one of A and B occurs is $y/25$ where y is

- (a) 12
- (b) 15
- (c) 18
- (d) 9

84. Variance of a random variable x is given by

- (a) $E(x - \mu)^2$
- (b) $E[x - E(x)]^2$
- (c) $E(x^2 - \mu)$
- (d) (a) or (b)

85. In a business venture, a man can make a profit of Rs. 50,000 or incurra loss of Rs. 20,000. The probabilities of making profit or incurring loss, from the past experience, are known to be 0.75 and 0.25 respectively. What is his expected profit ?

- (a) 11500
- (b) 12700
- (c) 32500
- (d) 32000

86. 3% of a given lot of manufactured parts are defective, what is the probability that in a sample of 4 items drawn with replacement none will be defective.

- (a) 0.585
- (b) 0.885
- (c) 0.558
- (d) None of these

87. If X is a Poisson variate and $P(X = 2) = P(X = 3)$ then the variance of X is is

- (a) 2
- (b) 3
- (c) 4
- (d) 5

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88. The incidence of skin disease in a chemical plant occurs in such the workers have 20% of change of suffering from it. What is the probability of 6 workers 4 or more will have skin disease.
- 0.1696
 - 0.01696
 - 0.1643
 - 0.01643
89. If mean and variance of random variable which follows the binomial distribution are 7 & 6 respectively, then the probability of success is:
- $\frac{6}{7}$
 - $\frac{36}{49}$
 - $\frac{1}{7}$
 - $\frac{1}{49}$
90. What is the first quartile of X having the following probability density function?
- function: $f(x) = \frac{1}{\sqrt{72\pi}} e^{-\frac{(x-10)^2}{72}}$ for $-\infty < X < \infty$
- 4
 - 5
 - 5.95
 - 6.75
91. Find the rank correlation coefficient of the following data:
- | | | | | | | |
|------------|---|---|---|---|---|----|
| Subject I | 3 | 5 | 8 | 4 | 7 | 10 |
| Subject II | 6 | 4 | 9 | 8 | 1 | 2 |
- 0.25
 - 0.45
 - 0.25
 - 0.45
92. If $\text{cov}(x, y) = 25$, what restrictions should be put for the standard deviations of x and y?
- No restriction.
 - The product of the standard deviations should be more than 25.
 - The product of the standard deviations should be less than 25.
 - The sum of the standard deviations should be less than 25.

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93. If the correlation coefficient between x and y is r then what is the correlation coefficient between $U = \frac{x-5}{10}$ and $V = \frac{y-7}{2}$

(a) r
(b) $-r$
(c) $(r-5)/2$
(d) $(r-7)/10$

94. For positive and perfectly correlated random variables, one of the regression coefficient is 1.28 and the standard deviation of X is 2, the variance of Y is

(a) 6.76
(b) 6.56
(c) 2.56
(d) 3.16

95. If $2x + 3y + 1 = 0$ and $5x + 6y + 1 = 0$ are the equations of two regression lines, then means of x and y are

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

96. Monthly salary of an employee was Rs.10,000 in the year 2000 and it was increased to Rs.20,000 in the year 2013 while the consumer price index number is 240 in year 2013 with the base year 2000, what should be his salary in comparison of consumer price index in the year 2013 ?

(a) 2,000
(b) 16,000
(c) 24,000
(d) None of these

97. 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) 117.24
(b) 115.43
(c) 118.35
(d) 116.48

98. The three index numbers, namely, Laspeyres, Paasche and Fisher do not satisfy _____ test.

(a) Time reversal
(b) Factor reversal
(c) Unit
(d) Circular

99. Let P_0 and P_1 be prices of a commodity in the base and current years respectively. The price relative with respect to base year is
- (a) P_1/P_0
- (b) P_0/P_1
- (c) $\frac{P_1 - P_0}{P_0}$
- (d) $\frac{P_1 - P_0}{P_1}$
100. If the Laspeyres's index is 110 and Paasche's index is 108 then what is the value of Fisher's index?
- (a) 106.50
- (b) 107.60
- (c) 108.99
- (d) 109.88

__**__