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DQR

A less-than ogive curve is drawn by plotting

- A. Less than Cumulative frequencies on the vertical axis
- B. More than Cumulative frequencies on the vertical axis
- C. Highest Frequencies on vertical axis
- D. Lowest Frequencies on vertical axis

A says, "B is my sister's son". B says, "C is my father-in-law". C says, "D is my wife's brother". What can be the relationship between A and D?

- A. Uncle-Nephew
- B. Brother-Sister
- C. Father-Son
- D. Cousins

A is B's Sister. C is B's mother. D is C's father. E is D's mother. How is A related to D

- A. Grandmother
- B. Grandfather
- C. Daughter
- D. Grand Daughter

Two frequency distributions are given to you. To compare them visually, the best diagram to be drawn on the same sheet is

- A. Pie chart
- B. Histogram
- C. Frequency polygon
- D. Bar chart

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5. 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 \_\_\_\_\_.  
(Take  $F(5, 0.14) = 3.43308$ ).
- A. ₹ 7,400
  - B. ₹ 8,100
  - C. ₹ 8,748
  - D. ₹ 8,322
6. Assuming that the discount rate is 12% per annum, how much would you pay to get ₹ 100 per year, growing at 4%, annually forever?
- A. ₹ 1,425
  - B. ₹ 1,300
  - C. ₹ 1,250
  - D. ₹ 1,150
7. Find the future value of an annuity of ₹ 5,000 made annually for 6 Years at interest rate of 12% compounded annually, if  $(1 + 0.12)^6 = 1.9738$ .
- A. ₹ 45,575
  - B. ₹ 40,575
  - C. ₹ 39,465
  - D. ₹ 37,868
8. If the interest rate on a loan is 1% per month, the effective annual rate of interest is.
- A. 12%
  - B. 12.36%
  - C. 12.68%
  - D. 12.84%

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9. A random variable has the following probability distribution :

X	2	3	5
P	K	2K	2K

Find K.

- A.  $1/3$   
 B.  $2/5$   
 C.  $1/5$   
 D.  $2/3$
10. A number is selected at random from the set  $\{1, 2, \dots, 99\}$ . The probability that it is divisible by 9 or 11 is \_\_\_\_\_  
 A.  $19/100$   
 B.  $19/99$   
 C.  $10/100$   
 D.  $10/99$
11. The coefficient of the range of the data: 7, 8, 4, 1, 9, 12, 18, 16, 94, 3, 5, -6 is \_\_\_\_\_  
 A. 133.6  
 B. 163.3  
 C. 166.3  
 D. 113.6
12. Two coins are tossed. Define the events  $A =$  {the first toss is head},  $A_2 =$  {number of heads is 2};  $A_1 =$  {number of heads is 1};  $A_0 =$  {number of heads is 0} and  $A_3 =$  {both outcomes are alike}. The event  $A$  is independent of \_\_\_\_\_  
 A.  $A_2$   
 B.  $A_1$   
 C.  $A_0$   
 D.  $A_1$  and  $A_0$  both

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13.  $\int x^2 \sqrt{x^2 + 4} dx = \text{_____}$

A.  $\frac{2}{9}(4^{\frac{3}{2}} - 3^{\frac{3}{2}})$

B.  $\frac{2}{9}(5^{\frac{3}{2}} - 4^{\frac{3}{2}})$

C.  $\frac{2}{9}(4^{\frac{3}{2}} - 3^{\frac{3}{2}})$

D.  $\frac{2}{9}(5^{\frac{3}{2}} - 4^{\frac{3}{2}})$

14.  $\int u(1-u)^9 du = \text{_____}$

A.  $\frac{1}{10 \times 11}$

B.  $\frac{1}{12 \times 11}$

C.  $\frac{1}{10 \times 9}$

D.  $\frac{1}{12 \times 13}$

15. Find  $\frac{dy}{dx}$  for  $x^2 y^2 + y = 0$

A.  $\frac{dy}{dx} = \frac{2y^2 x}{2y^2 x^2 + 1}$

B.  $\frac{dy}{dx} = \frac{-2y^2 x}{2y^2 x^2 + 1}$

C.  $\frac{dy}{dx} = \frac{-2y^2 x}{2y^2 x^2}$

D.  $\frac{dy}{dx} = \frac{2y^2 x}{2y^2 x^2}$

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16. Which of the following measure of central tendency will be unaffected if the lowest and highest observations are removed?
- A. Mean
  - B. Mode
  - C. Median
  - D. Range
17. Which sampling is based on the discretion of the sampler?
- A. Systematic
  - B. Multi-stage
  - C. Stratified
  - D. Purposive
18. Which of the followings is not a type of sampling?
- A. Probability
  - B. Non-probability
  - C. Stand-Alone
  - D. Mixed
19. An ogive is used to represent:
- A. The frequency of each data point.
  - B. The number of data points falling below a specific value.
  - C. The proportion of data points falling below a specific value.
  - D. The relationship between two variables

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24. Ram borrowed ₹ 5,000 at 12.5% per annum compound interest. The money was repaid after 3 years. The total interest paid by him approximately is \_\_\_\_\_, if  $(1 + 0.125)^3 = 1.4238$
- A. ₹ 2,419  
B. ₹ 2,200  
C. ₹ 2,000  
D. ₹ 2,500
25. A person invests in a fund that pays 4% per annum for four years. The future value of current ₹4,000 would be ₹\_\_\_\_\_. (Use, if needed,  $(1.04)^4 = 1.1698$ ,  $\frac{1}{(1.04)^4} = 0.8548$ ,  $(1.04)^3 = 1.2160$  and  $\frac{1}{(1.04)^3} = 0.8219$ .)
- A. ₹ 3,419  
B. ₹ 4,679  
C. ₹ 4,866  
D. ₹ 3,287
26. What is the present value of ₹ 5,000 to be obtained after six years if the interest rate is 5% per annum? (Use the following if needed :  $\frac{1}{1.05^6} = 0.74621$ ,  $0.71068$ ,  $0.67686$ , and  $0.64462$ , for  $n = 6, 7, 8$ , and  $9$  respectively.)
- A. ₹ 3,731  
B. ₹ 3,553  
C. ₹ 3,384  
D. ₹ 3,223
27. Find the effective rate of interest if an amount of ₹ 40,000 deposited in a bank for 1 year at the rate of 10% compounded semi-annually.
- A. 10.20%  
B. 10.05%  
C. 10.25%  
D. 10.10%

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28. For the first 20 natural numbers, the standard deviation is \_\_\_\_\_
- A. 5.77
  - B. 7.75
  - C. 5.64
  - D. 6.54
29. If Mean Deviation about Arithmetic Mean is 1.78 and Arithmetic Mean is 3.50 then coefficient of Mean Deviation about Arithmetic Mean is
- A. 50.85
  - B. 44.33
  - C. 52.65
  - D. 51.85
30. If Mean of a data set is 22 and Median is 22.33 then Mode is
- A. 21
  - B. 21.34
  - C. 22.99
  - D. 21.54
31. If Arithmetic Mean and coefficient of variation of  $y$  are 5 and 20 respectively, the variance of  $12 - 3y$
- A. 9
  - B. 81
  - C. 3
  - D. 100

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32. A histogram and a pie chart represent the same data on monthly expenses of a household. Which statement is most likely true?
- A. The histogram only shows the frequency of each expense category, while the pie chart shows the proportion of each category
  - B. Both the histogram and pie chart show the frequency of each expense category
  - C. Both the histogram and pie chart show the proportion of each expense category
  - D. Pie charts are always better than histograms for representing expenses
33. Which of the following measure of central tendency depends on the position of the observation?
- A. Mean
  - B. Median
  - C. Mode
  - D. Harmonic Mean
34. The following set of data cannot be presented in a table.
- A. The heights of students described in centimeters
  - B. The weights of candidates expressed in kilograms
  - C. The amount of rainfall opined as "medium," "average," "heavy", etc
  - D. The number of bills per day cleared by an auditor in a month
35. According to the empirical rule, if the data form a "bell-shaped" distribution, then the maximum and minimum frequencies occur at \_\_\_\_\_ and \_\_\_\_\_ respectively.
- A. Middle, left end
  - B. Middle, right end
  - C. End, middle
  - D. Middle, ends

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47. The mean of a set of 20 observations is 18.3. The mean is reduced by 0.6 when a new observation is added to the set. The new observation is:
- A. 17.6
  - B. 18.9
  - C. 5.7
  - D. 24.6
48. Consider the data sets:  $X = \{-6, 2, -2, 6\}$ ,  $Y = \{4, 8, 2, 6\}$ ,  $Z = \{103, 109, 102, 101\}$ . Let  $S_x$ ,  $S_y$  and  $S_z$  be the standard deviations of the sets  $X$ ,  $Y$  and  $Z$  respectively. We have the relations,
- A.  $S_x < S_y < S_z$
  - B.  $S_y < S_x < S_z$
  - C.  $S_x < S_z < S_y$
  - D.  $S_x < S_z < S_y$
49. If in a data set, 25 percent of values are smaller than 30 and one-fourth of values are larger than 70, then the coefficient of quartile deviation is \_\_\_\_\_ %.
- A. 40
  - B. 30
  - C. 70
  - D. 50
50. If there are two groups containing 40 and 30 observations and have arithmetic means as 50 and 60, then the combined arithmetic mean is
- A. 55.48
  - B. 56.35
  - C. 54.28
  - D. 50.28

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51. If the arithmetic mean of two numbers is 10 and the geometric mean is 6, then the difference in the numbers is
- A. 12
  - B. 14
  - C. 16
  - D. 8
52. In an arithmetic progression, the seventh term is  $x$ , and  $(x+7)^{\text{th}}$  term is zero. Then  $x^{\text{th}}$  term is
- A. 6
  - B. 7
  - C. 8
  - D. 10
53. If the second and eight terms of an arithmetic progression (AP) are equal to constant  $\alpha$ , then the sum of first  $n$  terms of this AP is equal to
- A.  $n\alpha$
  - B.  $\frac{\alpha}{n}$
  - C.  $2n + n(n-1)$
  - D.  $n + \alpha(n-1)$
54. The 3<sup>rd</sup> term of arithmetic progression is 7 and Seventh term is 2 more than thrice of third term. The common difference is
- A. 4
  - B. 3
  - C. 5
  - D. 6

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55. The range of the coefficient of correlation is
- A. between -1 and 1
  - B. between -1 and 1 including 1
  - C. between -1 and 1 including -1
  - D. between -1 and 1 including -1, 1
56. A company produces 5 defective items out of 300 items. The probability distribution follows a :
- A. Binomial distribution
  - B. Normal distribution
  - C. Poisson distribution
  - D. Standard normal distribution
57. The mean of Poisson distribution is 4. The probability of two-successes is \_\_\_\_\_
- A.  $\frac{8}{e^4}$
  - B.  $\frac{4}{e^4}$
  - C.  $\frac{16}{e^4}$
  - D.  $\frac{8}{e^2}$
58. If the regression lines are  $3x - 4y + 8 = 0$  and  $4x - 3y = 1$ , then the correlation coefficient between  $x$  and  $y$  is \_\_\_\_\_
- A.  $3/4$
  - B.  $3/8$
  - C.  $4/8$
  - D.  $1/4$

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59. A car starts from a point, runs 20 kms towards north, turns right and runs 35 kms, turns right again and runs. Which is the direction now it is facing?
- A. North
  - B. South
  - C. East
  - D. West
60. Shyam walks 12 m South from his house, turns left and walks 20 m, again turns left and walks 45 m, then turns right and walks 10 m to reach coffee shop. In which direction is coffee shop from his house?
- A. South West
  - B. East
  - C. North East
  - D. North
61. If Shyam sees the rising sun behind the tower and setting sun behind the Railway station from his house. What is the direction of tower from the Railway station?
- A. South
  - B. North
  - C. West
  - D. East
62. Five players named as A, B, C, D, and E are sitting on a bench, facing south, and are waiting to be interviewed by a selector. The person C is an immediate neighbor of both A and B. The person A is the fourth person from right end, If E is to the right of B, then where is E sitting?
- A. Fifth from right end
  - B. Fourth from right end
  - C. Fifth from left end
  - D. Second from right end

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63. The equation  $x^3 - 3x^2 - 4x + 12 = 0$  has three real roots. They are:
- A. -2, 2, 3  
 B. -2, -2, 3  
 C. 2, -2, -3  
 D. -2, 2, -3
64. If  $\alpha$  and  $\beta$  are roots of the equation  $ax^2 + bx + c = 0$ , then the equation whose roots are  $\frac{1}{\alpha}$  and  $\frac{1}{\beta}$  is:
- A.  $cx^2 - bx + a = 0$   
 B.  $cx^2 + bx + a = 0$   
 C.  $x^2 + bx + a = 0$   
 D.  $x^2 + bx - a = 0$
65. If  $\alpha$  and  $\beta$  are roots of the equation  $x^2 - 8x + 12 = 0$ , then  $\frac{1}{\alpha} + \frac{1}{\beta} =$  \_\_\_\_\_
- A. 2/3  
 B. 2/4  
 C. 3/4  
 D. 4/5
66. The roots of the equation  $x^2 - 7x + 10 = 0$  are:
- A. 2 and 5  
 B. -2 and -5  
 C. 2 and -5  
 D. -2 and 5

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67. Which index number formula satisfies both the time reversal and factor reversal tests?
- A. Fisher's Ideal index
  - B. Laspeyres' index
  - C. Paasche's index
  - D. Marshall-Edgeworth index
68. What of the followings is not a test of adequacy in the context of index numbers?
- A. Unit Test
  - B. Square Test
  - C. Circular Test
  - D. Factor Reversal Test
69. If the prices of all commodities in the base year are twice the values of the respective commodities in the current year, then the Fisher's ideal index number is equal to :
- A. 200
  - B. 50
  - C. 400
  - D. 25
70. Which index number formula does not satisfy the time reversal test?
- A. Fisher's Ideal index and Laspeyre's Index
  - B. Laspeyres' index and Paasche's Index
  - C. Paasche's Index and Fisher's Ideal Index
  - D. Laspeyres' index, Fisher's Ideal Index and Paasche's Index

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71. A user wants to create a password using 4 lowercase letters (a-z) and 2 uppercase letters (A-Z). No letter can be repeated in any form. In how many ways can the password be created if the password must start with an uppercase letter?
- A.  $26 \times 25 \times 24 \times 23 \times 22 \times 5 \times 21$   
B.  $26 \times 25 \times 24 \times 23 \times 22 \times 2 \times 21$   
C.  $26 \times 5 \times 25 \times 24 \times 23 \times 2 \times 22 \times 21$   
D.  $6 \times 26 \times 25 \times 24 \times 23 \times 22 \times 21$
72. In how many ways can 5 boys and 3 girls sit in a row so that no two girls are together?
- A. 14,400  
B. 14,000  
C. 14,425  
D. 12,400
73. In how many ways the letters of the word "STADIUM" be arranged in such a way that the vowels all occur together?
- A.  $7!/3!$   
B.  $5! 4!$   
C.  $5! 3!$   
D.  $7! 3!$
74. How many ways can 5 different trophies can be arranged on a shelf if one particular trophy must always be in the middle?
- A. 24  
B. 120  
C. 48  
D. 144

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82. If  $\log_2 b = 3$  and  $\log_2 c = 2$ , then  $\log_2 c$  is:
- A. 5
  - B. 6
  - C. 9
  - D. 1
83. If  $2^x = 4^y = 8^z$  and  $\frac{1}{2x} + \frac{1}{4y} + \frac{1}{6z} = \frac{24}{7}$ , then the value of  $z$  is:
- A. 7/16
  - B. 7/32
  - C. 7/48
  - D. 7/64
84. A fraction becomes 1, when 3 are added to the numerator and 1 is added to the denominator. But when the numerator and denominator are decreased by 2 and 1, respectively, it becomes 1/2. The denominator of the fraction is:
- A. 5
  - B. 6
  - C. 7
  - D. 8
85. If the four numbers  $1/4$ ,  $1/6$ ,  $1/10$ , and  $1/x$  are proportional, then what is the value of  $x$ ?
- A. 14
  - B. 15
  - C. 10
  - D. 1/12

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86. If  $f(x) = (x-1) \times (x+1)$ , then  $\frac{dy}{dx} =$  \_\_\_\_\_.

- A.  $3x^2 - 1$
- B.  $3x^2 + 1$
- C.  $x^2 - 3$
- D.  $x^2 + 3$

87. The  $\lim_{x \rightarrow 2} \frac{x^2 - 4x + 4}{x - 2} =$  \_\_\_\_\_.

- A. 0
- B. 1
- C. 2
- D. 0.5

88. Consider the following relations on  $A = \{1, 2, 3\}$ ,  $R = \{(1, 1), (1, 2), (1, 3), (3, 3)\}$ ,  $S = \{(1, 1), (1, 2), (2, 1), (2, 2), (3, 3)\}$ ,  $T = \{(1, 1), (1, 2), (2, 2), (2, 3)\}$  and  $\phi =$  empty set. Which one of these forms an equivalence relation?

- A. R
- B. S
- C. T
- D.  $\phi$

89. If  $f(x) = (x+1)^{x+1}$ , then find  $f'(0)$

- A. 0
- B. 1
- C. -1
- D. 2

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90.

You bought a painting 10 years ago as an investment. You originally paid ₹ 85,000 for it. If you sold it for ₹ 4,84,050, what was your annual return on investment?

- A. 47%
- B. 4.7%
- C. 19%
- D. 12.8%

91.

What is the present value of an investment that pays ₹ 400 at the end of three years and ₹ 500 at the end of 6 years?

- A. ₹ 320
- B. ₹ 335
- C. ₹ 340
- D. ₹ 280

92.

At 8% compounded annually, how long will it take ₹ 750 to double?

- A. 6.5 years
- B. 48 months
- C. 9 years
- D. 12 years

93.

You are considering two investments: Investment A yields 10% compounded quarterly. Investment B yields  $r\%$  compounded semi-annually. Both investments have equal annual yields. Find  $r$ .

- A. 19.875%
- B. 10%
- C. 10.38%
- D. 10.125%

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94. From a bag containing 4 red, 5 blue and 6 white caps, two caps are drawn without replacement. What is the probability that the caps are of different colours?
- A.  $\frac{74}{105}$
- B.  $\frac{37}{105}$
- C.  $\frac{94}{105}$
- D.  $\frac{31}{105}$
95. A question in statistics is given to three students A, B, and C. Their chances of solving the question are  $\frac{1}{3}$ ,  $\frac{1}{5}$  and  $\frac{1}{7}$  respectively. The probability that the question would be solved is
- A.  $\frac{19}{35}$
- B.  $\frac{16}{35}$
- C.  $\frac{1}{105}$
- D.  $\frac{104}{105}$
96. A company produces two types of products, A and B. The probability of a defective product in type A is 0.05 and in type B is 0.03. If the company produces 60% type A and 40% type B, what is the probability of a randomly selected product being defective?
- A. 0.042
- B. 0.03
- C. 0.048
- D. 0.052

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97. In a certain code TEACHER is written as VGCEJGT, How is CHILDREN written in that code.
- A. EJKNEGTP
  - B. EGKNFITP
  - C. EJKNFGTO
  - D. EJKNFTGP
98. If a function is given by  $f(x) = e^{3x}$ , what is the derivative of the function?
- A.  $3e^{3x}$
  - B.  $e^{3x}$
  - C.  $3xe^{3x}$
  - D.  $3e^{2x} + 3$
99. Find the missing value in the series : 51, 52, 60, 87, 151, \_\_\_\_, 492.
- A. 195
  - B. 276
  - C. 317
  - D. 420
100. In a certain code INACTIVE is written as VITCANIE, How is COMPUTER written in the same code
- A. PMOCRETU
  - B. ETUPMOCR
  - C. UTEPMOCR
  - D. MOCPETUR