NIRAJ ACADEMY FOR EXCELLENCE
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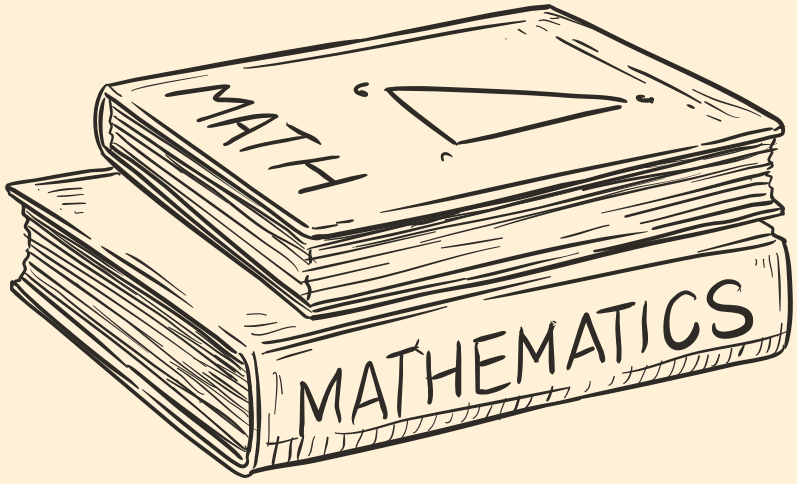
Maths

CA Foundation



PYQs

2018-2025

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NOV 2018

01. $\frac{3x-2}{5x+6}$ is the duplicate ratio of $\frac{2}{3}$ then find the value of x:

(a) 2 (b) 6
(c) 5 (d) 9

02. $\frac{2^{m+1} x 3^{2m-n+3} x 5^{n+m+4} x 6^{2n+m}}{6^{2m+n} x 10^{n+1} x 15^{m+3}}$

(a) $3^{2m - 2n}$ (b) $3^{2n - 2m}$
(c) 1 (d) None of the above

03. If x : y : z = 7 : 4 : 11 then $\frac{x+y+z}{z}$ is:

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

04. $\log_2 \log_2 \log_2 16$ = ?

(a) 0 (b) 3
(c) 1 (d) 2

05. A man invests an amount of ₹ 15860 in the names of his three sons A, B and C in such a way that they get the same amount after 2, 3 and 4 years respectively. If the rate of interest is 5% then ratio of amount invested in the name of A,B and C is

(a) 6:4:3 (b) 30:12:5
(c) 3:4:6 (d) None of the above

06. When two roots of quadratic equation are α, $\frac{1}{\alpha}$ then what will be the quadratic equation:

(a) $\alpha x^2 - (\alpha^2+1)x + \alpha = 0$ (b) $\alpha x^2 - \alpha^2 x + 1 = 0$
(c) $\alpha x^2 - (\alpha^2+1)x + 1 = 0$ (d) None of these

07. Let α and β be the roots of $x^2 + 7x + 12 = 0$. Then the value of $\left(\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}\right)$ will be

(a) $\frac{49}{144} + \frac{144}{49}$ (b) $\frac{7}{12} + \frac{12}{7}$
(c) $-\frac{91}{12}$ (d) None of the above

08. If $A = \begin{bmatrix} -5 & 2 \\ 1 & -3 \end{bmatrix}$, then adj A is

(a) $\begin{bmatrix} -3 & -2 \\ -1 & -5 \end{bmatrix}$ (b) $\begin{bmatrix} 5 & 1 \\ 2 & 3 \end{bmatrix}$
(c) $\begin{bmatrix} 3 & -2 \\ -1 & 5 \end{bmatrix}$ (d) $\begin{bmatrix} 3 & 2 \\ 1 & 5 \end{bmatrix}$

09. If A = $\begin{bmatrix} 5 & x \\ y & 0 \end{bmatrix}$ and A=A^T, then
(a) $x = 0, y = 5$ (b) $x = y$
(c) $x + y = 5$ (d) None of these

10. Let A^T be the transpose of matrix A having order $m \times n$,then A^T A is a matrix of order
(a) $n \times n$ (b) $m \times m$
(c) $m \times n$ (d) $n \times m$

11. On Solving the Inequalities 5x + y ≤ 100, x + y ≤ 60, x ≥ 0, y ≥ 0, we get the following situation:
(a) (0, 0), (20, 0), (10, 50) & (0, 60) (b) (0, 0), (60, 0), (10, 50) & (0, 60)
(c) (0, 0), (20, 0), (0, 100) & (10, 50) (d) None of these

12. If ₹ 10,000 is invested at 8% per year compound quarterly, then the value of the investment after 2 years is [given $(1+ 0.2)^8$–1.171659]
(a) ₹10,716.59 (b) ₹11,716.59
(c) ₹117.1659 (d) None of the above

13. A bank pays 10% rate of interest, interest being calculated half yearly. A sum of ₹ 400 is deposited in the bank. The amount at the end of 1 years will be
(a) ₹439 (b) ₹440
(c) ₹442 (d) ₹441

14. A certain money doubles itself in 10 years when deposited on simple interest. It would triple itself in
(a) 30 years (b) 20 years
(c) 25 years (d) 15 years

15. A men deposited ₹8,000 in a bank for 3 years at 5% per annum compound interest, after 3 years he will get
(a) ₹9,000 (b) ₹8,800
(c) ₹9,200 (d) ₹9,261

16. If in two years time a principal of ₹100 amounts to ₹121 when the interest at the rate of *r*% is compounded annually, then the value of *r* will be
(a) 14 (b) 10.5
(c) 15 (d) 10

17. A certain sum of money Q was deposited for 5 year and 4 months at 4.5% simple interest and amounted to ₹248, then the value of Q is
(a) ₹240 (b) ₹200
(c) ₹220 (d) ₹210

18. The effective rate of interest for one year deposit corresponding to a nominal 7% rate of interest per annum convertible quarterly is
(a) 7% (b) 7.4%
(c) 7.5% (d) 7.18%

19. How much will ₹ 25,000 amount to in 2 years at compound interest if the rates for the successive years are 4% and 5% per year
(a) ₹27,000 (b) ₹27,300
(c) ₹27,500 (d) ₹27,900

20. ₹ 8,000/- at 10% per annum interest compounded half yearly will become at the end of one year
(a) ₹ 8,800/- (b) ₹ 8,900/-
(c) ₹ 8820 (d) ₹ 9,600

21. The value of furniture depreciates by 10% a year, if the present value of the furniture in an office is ₹ 21870, calculate the value of furniture 3 years ago
(a) ₹ 30,000 (b) ₹40,000
(c) ₹ 35,000 (d) ₹50,000

22. If compound interest on a sum for 2 years at 4% per annum is ₹102, then the simple interest on the same period at the same rate will be
(a) ₹ 90 (b) ₹ 100
(c) ₹ 101 (d) `93

23. If the difference between the compound interest compounded annually and simple interest on a certain amount at 10% per annum for two years is ₹ 372, then the principal amount is
(a) ₹ 37,000 (b) ₹ 37,200
(c) ₹ 37,500 (d) None of the above

24. What is the net present value of piece of property which would be valued at ₹2 lakh at the end of 2 years? (Annual rate of increase = 5%)
(a) ₹ 2.00 lakh (b) ₹ 1.81 lakh
(c) 2.01 lakh (d) None of the above

25. The number of words from the letters of the word BHARAT, in which B and H will never come together, is
(a) 120 (b) 360
(c) 240 (d) None of the above

26. The value of N in $\frac{1}{7!}+\frac{1}{8!}=\frac{N}{9!}$ is
(a) 81 (b) 64
(c) 78 (d) 89

27. If ${}^{n}P_{r} = 720$ and ${}^{n}C_{r} = 120$ then r is
(a) 4 (b) 5
(c) 3 (d) 6

28. A bag contains 4 red, 3 black and 2 white balls. In how many ways 3 balls can be drawn from this bag so that they include at least one black ball?
(a) 46 (b) 64
(c) 86 (d) None of the above

29. If the p^{th} term of an A.P. is 'q' and the q^{th} term is 'p', them its rth term is
(a) $p + q + r$ (b) $p + q - r$
(c) $p - q - r$ (d) $p + q$

30. The 3rd term of a G.P. is $\frac{2}{3}$ and the 6th term is $\frac{2}{81}$, then the 1st term is
(a) 2 (b) 6
(c) 9 (d) $\frac{1}{3}$

31. The sum of the series –8, –6, –4,...n terms is 52. The number of terms n is

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

32. The value of K, for which the terms $7K+3, 4K-5, 2K+10$ are in A.P.,is
(a) –13 (b) –23
(c) 13 (d) 23

33. A is {1,2,3,4} and B is {1,4,9,16,25} if a function f is defined from set A to B where $f(x) = x^2$ then the range of f is:
(a) {1,2,3,4} (b) {1,4,9,16}
(c) {1,4,9,16,25} (d) None of these

34. If A = {1,2} and B = {3, 4}. Determine the number of relations from A and B:
(a) 3 (b) 16
(c) 5 (d) 6

35. If A = {1,2,3,4,5,6,7} and B = {2, 4,6,8}. Cardinal number of A - B is:
(a) 4 (b) 3
(c) 9 (d) 7

36. Identity the function from the following:
(a) {(1,1), (1,2), (1,3)} (b) {(1,1), (2,1), (2,3)}
(c) {(1,2), (2,2), (3,2), (4,2)} (d) None of these

37. Let $x = at^3, y = \frac{a}{t^2}$, Then $\frac{dy}{dx}$
(a) $\frac{-3a}{t^6}$ (b) $\frac{-1}{t^6}$
(c) $\frac{1}{3at^2}$ (d) None of the above

38. xy = 1 then $y^2 + \frac{dy}{dx} = ?$
(a) 1 (b) 0
(c) 2 (d) None of the above

39. $\int x\left(x^2+4\right)^5 dx$ is equal to
(a) $\frac{1}{12}(x^2+4)^6 + c$ (b) $(x^2+4)^6 + c$
(c) $\frac{1}{6}(x^2+4)^6 + c$ (d) None of the above

40. $\int_{-1}^{3}(1+3x-x^3)\,dx$ is equal to
(a) –3 (b) –4
(c) 3 (d) 4

41. If PLAY is coded as 8123 and RHYME is coded as 49367. What will be code of MALE?
(a) 6285 (b) 6217
(c) 6395 (d) 6198

42. Find out the next number in the following series 7,11,13,17,19,23,25,29,?
(a) 33 (b) 30
(c) 32 (d) 31

43. **If HONEY is coded as JQPGA, which word is code as VCTIGVU?**
(a) CARPETS (b) TRAPETS
(c) UMBRELU (d) TARGETS

44. **Find odd man out of the following series**
15,21,63,81,69
(a) 15 (b) 21
(c) 81 (d) 63

45. **Find odd man out of the following series**
7, 9, 13, 17, 19.
(a) 9 (b) 7
(c) 13 (d) 19

46. **Rahim started from point X and walked straight 5 km. West, then turned left and walked straight 2 km and again turned left and walked straight 7 km. In which direction is he from the point X?**
(a) North-East (b) South-East
(c) South-West (d) North-West

47. **A man started to walk East. After moving a certain distance, he turns to his right. After moving some distance, he turns to his right again. After moving a little he turns now to his left currently, he is going in ..... Direction.**
(a) North (b) East
(c) West (d) South

48. **Manu wants to go to the market. He starts from his house towards North reaches at a crossing after 30m. He turns towards East, goes 10m till the second crossing and turns again, moves towards South straight for 30m where marketing complex exits. In which direction is the market from his house?**
(a) North (b) West
(c) South (d) East

49. **Anoop Starts walking towards South after walking 15 meters he turns towards North. After walking 20 meters he turns towards East and walks 10 meters. He then turns towards south and walks 5 meters. In which direction is he from the original position.**
(a) East (b) South
(c) West (d) North

50. **Pointing to man in a photograph, a woman said "the father of his brother is the only son of my grandfather", how is the woman related to the man in the photograph?**
(a) Mother (b) Daughter
(c) Aunty (d) Sister

51. **Six Persons are seen together in a group. They are A, B, C, D, E and F. B is brother of D, but D is not brother of B. F is brother of B. C and A are married together. F is son of C, but C is not mother of F. E is brother of A. The number of female member in the group is**
(a) 1 (b) 2
(C) 3 (D) 4

52. **Ram and Mohan are brothers, Shankar is Mohan's father. Chhaya is Shankar's sister. Priya is shankar's niece. Shubhra is Chhaya's granddaughter. Then, Ram is Shubhra's**
(a) Brother (b) Uncle
(c) Cousin (d) Nephew

53. If P + Q means P is the mother of Q, P ÷Q means P is the father of Q, P - Q means P is the sister of Q. Then which of the following relationship shows that M is the daughter of R?
(a) R÷M+N (b) R+N÷M
(c) R-M÷N (d) None of these

54. Five students A, B, C, D and E are standing in a row. D is on the right of E, B is on the left of E but on the right of A. D is next to C on his left. The student in middle is
(a) B (b) A
(c) E (d) C

55. Six flats on a floor in two rows facing North and South are allotted to P, Q, R, S, T and U. If Q gets a North facing flat and is not next to S. S and U get diagonally opposite flat. R next to U gets a South facing flat and T gets a North facing flat. Whose flat is between Q and S?
(a) P (b) T
(c) R (d) U

56. Eight persons A, B, C, D, E, F, G and H are sitting in a line. E Sits second right to D. H sits fourth left to D. C and F are immediate neighbors, but C is not immediate neighbor of A. G is not neighbor of E. Only two persons sit between A and E. The persons on left and right end respectively are
(a) G and B (b) G and E
(c) H and E (d) B and E

57. Six children A, B, C, D, E and F are sitting in a row. B is between F and D. E is between A and C. However, A does not sit next to F or D. C does not sit next to D. Then, F is sitting between.
(a) B and D (b) B and C
(c) E and C (d) None of the above

58. Directions (27-29) : Each of the following question contains two statements followed by two conclusions number I and II. You have to decide which of the given conclusions definitely follows from the given statements.
Statements:
1. Some phones are watches
2. All watches are guns
Conclusions :
I. All guns are watches
II. Some guns are phones.
(a) Only conclusion I follows (b) Only conclusion II follows
(c) Neither I nor II follows (d) Either I or II follows

59. Statements:
1. Some books are pens
2. No pen is pencil
Conclusions :
I. Some books are pencil
II. No book is pencil
(a) Only conclusion I follows (b) Only conclusion II follows
(c) Either I or II follows (d) Neither I nor II follows

60. Statements:
1. Some players are singers
2. All singers are tall
Conclusions :
I. Some players are tall
II. All players are tall
(a) Only conclusion I follows (b) Only conclusion II follows
(c) Either I or II follows (d) Neither I nor II follows

61. **The following frequency distribution**

X:	12	17	24	36	45
Y:	2	5	3	8	9

is classified as:

(a) Discrete distribution (b) Continuous distribution
(c) Cumulative frequency distribution (d) None of the above

62. **Histogram is useful to determine graphically the value of**

(a) Arithmetic mean (b) Mode
(c) Median (d) None of the above

63. **Data are said to be _____ if the investigator himself is responsible for the collection of the data.**

(a) Primary data (b) Secondary Data
(c) Mixed of primary and secondary data (d) None of the above

64. **A suitable graph for representing the portioning of total into sub parts in statistics is**

(a) A pictograph (b) A Pie Chart
(c) An ogive (d) Histogram

65. **The number of times a particular items occurs in a class interval is called its**

(a) Mean (b) Cumulative frequency
(c) Frequency (d) None of the above

66. **An ogive is a graphical representation of**

(a) Cumulative frequency distribution of (b) Ungrouped data
(c) A frequency distribution (d) None of the above

67.

Class	0–10	10–20	20–30	30–40	40–50
Frequency	4	6	20	8	3

For the class 20-30, cumulative frequency is

(a) 26 (b) 10
(c) 41 (d) 30

68. **If the mean of the following distribution is 6 then the value of P is**

X:	2	4	6	10	P + 5
F	3	2	3	1	2

(a) 7 (b) 5
(c) 11 (d) 8

69. **If total frequencies of three series are 50,60 and 90 and their means are 12, 15 and 20 respectively, then the mean of their composite series is**

(a) 15.5 (b) 16
(c) 14.5 (d) 16.5

70. **If the variance of 5, 7, 9 and 11 is 4, then the coefficient of variation is**

(a) 25 (b) 15
(c) 17 (d) 19

71. **Standard Deviation for the marks obtained by a student in monthly test in mathematic (out of 50) as 30, 35,25, 20, 15 is**

(a) 25 (b) 50
(c) $\sqrt{50}$ (d) $\sqrt{30}$

72. If in a moderately skewed distribution the values of mode and mean are 32.1 and 35.4 respectively, then the value of the median is
(a) 33.3 (b) 34
(c) 34.3 (d) 33

73. If the standard deviation for the marks obtained by a student in monthly test is 36, then the variance is
(a) 36 (b) 6
(c) 1296 (d) None of the above

74. The median of the data 5, 6, 7, 7, 8, 9, 10, 11, 11, 12, 15, 18, 18 and 19 is
(a) 10 (b) 10.5
(c) 11.5 (d) 11

75. The means of 20 items of a data is 5 and if each item is multiplied by 3, then the new mean will be
(a) 20 (b) 5
(c) 15 (d) 10

76. The Geometric mean of 3, 6, 24 and 48 is
(a) 6 (b) 8
(c) 12 (d) 24

77. The Algebraic sum of the deviation of a set of values from their arithmetic mean is
(a) >0 (b) =0
(c) <0 (d) None of the above

78. Which one of the following is not a central tendency?
(a) Mean Deviation (b) Arithmetic mean
(c) Median (d) Mode

79. If the range of a set of values is 65 and maximum value in the set is 83, then the minimum value in the set is
(a) 74 (b) 9
(c) 18 (d) None of the above

80. The two lines of regression intersect at the point:
(a) Mean (b) Median
(c) Mode (d) None of the these

81. If the two lines of regression are $x + 2y - 5 = 0$ and $2x + 3y - 8 = 0$, then the regression line of y on x is
(a) $x + 2y - 5 = 0$ (b) $x + 2y = 0$
(c) $2x + 3y - 8 = 0$ (d) $2x + 3y = 0$

82. If the two regression lines are $3X = Y$ and $8Y = 6X$, then the value of correlation coefficient is
(a) –0.5 (b) 0.5
(c) 0.75 (d) –0.80

83. The regression coefficient is independent of the change of
(a) Origin (b) Scale
(c) Scale and origin both (d) None of these

84. If the correlation coefficient between the variables X and Y is 0.5, then the correlation coefficient between the variables $2x - 4$ and $3 - 2y$ is
(a) 0.5 (b) 1
(c) –0.5 (d) 0

85. If $P(A)=\frac{1}{2}, P(B)=\frac{1}{3}$, and $P(A\cap B)=\frac{1}{4}$ then $P(A\cup B)$ is equal to

(a) $\frac{11}{12}$ (b) $\frac{07}{12}$

(c) $\frac{10}{12}$ (d) $\frac{1}{6}$

86. Two different dice are thrown simultaneously , then the probability, that the sum of two numbers appearing on the top of dice is 9 is

(a) $\frac{1}{9}$ (b) $\frac{8}{9}$

(c) $\frac{7}{9}$ (d) None of the above

87. If (A U B) = 0.8 and P (A ∩ 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

88. The probability that a leap year has 53 Wednesday is

(a) $\frac{2}{7}$ (b) $\frac{3}{5}$

(c) $\frac{1}{7}$ (d) $\frac{2}{3}$

89. A coin is tossed six times, then the probability of obtaining heads and tails alternatively is

(a) $\frac{1}{2}$ (b) $\frac{1}{32}$

(c) $\frac{1}{64}$ (d) $\frac{1}{16}$

90. Ram is known to hit a target in 2 out of 3 shots where as Shyam is known to hit the same target in 5 out of 11 shots. What is the probability that the target would be hit if they both try?

(a) $\frac{9}{11}$ (b) $\frac{6}{11}$

(c) $\frac{10}{33}$ (d) $\frac{3}{11}$

91. For a Poisson variate X, P(X=2) = 3P (X = 4), then the standard deviation of X is

(a) 2 (b) 3

(c) 4 (d) $\sqrt{2}$

92. The mean of the Binomial distribution $B\left(4,\frac{1}{3}\right)$ is equal to

(a) $\frac{3}{5}$ (b) $\frac{4}{3}$

(c) $\frac{8}{3}$ (d) $\frac{3}{4}$

93. If for a normal distribution Q_1= 54.52 and Q = 78.86, then the median of the distribution is

(a) 12.17 (b) 66.69

(c) 39.43 (d) None of these

94. What is the mean of X having the following density function?

$F(x)=\frac{1}{4\sqrt{2x}}e^{\frac{(x-10)^2}{32}}$ for $-\infty < x < \infty$

(a) 4 (b) 10

(c) 40 (d) None of the above

95. **The probability that a student is not a swimmer is 1/5, then the probability that out of five students four are swimmer is**

(a) $\left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)$ (b) ${}^5C_1\left(\frac{1}{5}\right)^4\left(\frac{4}{5}\right)$

(c) ${}^5C_4\left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)$ (d) None of the above

96. **Which of the following statement is true?**

(a) Paache'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 Paache'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

97. **If Laspeyre's Index Number is 250 and Paache's Index Number is 160. then Fisher's index number is:**

(a) 40000 (b) $\frac{25}{16}$

(c) 200 (d) $\frac{16}{25}$

98. **The simple average method is used to calculate:**

(a) Trend Variation (b) Cyclical Variation

(c) Seasonal Variation (d) Irregular Variation

99. **If $\sum P_0Q_0 = 240$, $\sum P_1Q_1 = 480$, $\sum P_1Q_0 = 600$ and $\sum P_0Q_1 = 192$, then Laspeyre's index number is:**

(a) 250 (b) 300

(c) 350 (d) 200

100. **The Sale of Cold Drink would go up in summers and go down in the winters is an example of:**

(a) Trend Variation (b) Cyclical Variation

(c) Seasonal Variation (d) Irregular Variation

Answer Key
BMRS

1	B	21	A	41	B	61	A	81	A
2	C	22	B	42	D	62	B	82	B
3	A	23	B	43	D	63	A	83	A
4	C	24	B	44	C	64	B	84	C
5	A	25	C	45	A	65	C	85	B
6	A	26	A	46	B	66	A	86	A
7	C	27	C	47	D	67	D	87	C
8	A	28	B	48	D	68	A	88	A
9	B	29	B	49	A	69	D	89	C
10	B	30	B	50	D	70	A	90	A
11	A	31	C	51	B	71	C	91	D
12	B	32	B	52	B	72	C	92	B
13	D	33	B	53	B	73	C	93	B
14	B	34	B	54	C	74	B	94	B
15	D	35	A	55	B	75	C	95	C
16	D	36	C	56	B	76	C	96	D
17	B	37	D	57	B	77	B	97	C
18	D	38	B	58	B	78	A	98	C
19	B	39	A	59	C	79	C	99	A
20	C	40	B	60	A	80	A	100	C

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MAY 2019

CA Foundation –May-19
Question Paper

Marks 100 **Time : 2 Hours**

"BUSINESS MATHEMATICS "

01. if the ratio of two numbers is 7 : 11. If 7 is added to each number then the new ratio will be 2 : 3 then the numbers are.

(a) 49, 77 (b) 42, 45
(c) 43,42 (d) 39, 40

02. $\log_{2\sqrt{2}}(512) : \log_{3\sqrt{2}} 324 =$

(a) 128 : 81 (b) 2 : 3
(c) 3 : 2 (d) None

03. If $2^{x^2} = 3^{y^2} = 12^{z^2}$ **then**

(a) $\frac{1}{x^2}+\frac{1}{y^2}=\frac{1}{z^2}$ (b) $\frac{1}{x^2}+\frac{2}{y^2}=\frac{1}{z^2}$

(c) $\frac{2}{x^2}+\frac{1}{y^2}=\frac{1}{z^2}$ **(d)** None

04. Then value of

$$\log_5\left(1+\frac{1}{5}\right)+\log_5\left(1+\frac{1}{6}\right)+\square+\log_5\left(1+\frac{1}{624}\right)=$$

(a) 2 **(b) 3**
(c) 5 (d) 0

05. Find the condition that one roots is double the other of $ax^2+bx+c=0$

(a) $2b^2 = 3ac$ (b) $b^2 = 3ac$
(c) $\mathbf{2b^2 = 9ac}$ (d) $2b^2 > 9ac$

06. $[1\ 2\ 3]\begin{bmatrix}\log_{10}2\\ \log 3\\ \log_{10}4\end{bmatrix} =$

(a) $\log_{10}(1521)$ **(b)** $\mathbf{\log_{10}(1152)}$
(c) $\log_{10}(5211)$ (d) $\log_{10}(2151)$

07. If $\begin{pmatrix}x+y & 1\\ 1 & x-y\end{pmatrix}+\begin{pmatrix}2 & 3\\ 2 & -4\end{pmatrix}=\begin{pmatrix}12 & 4\\ 3 & 0\end{pmatrix}$ ***then***

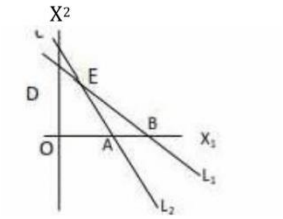
(a) $x = 7\ y = -3$ (b) $x = -7, y = -3$
(c) $x = -7, y = 3$ **(d) x = 7, y = 3**

08. The solution set of the in equation x +2 > 0 and 2x – 6 > 0 is

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

09. The common region represented by the following in equalities

$L_1 = X_1 + X_2 \leq 4$; $L_2 = 2X_1 + X_2 \geq 6$



(a) OABC
(b) Outside of OAB
(c) Δ BCE
(d) Δ ABE

10. A sum was invested for 3 years as per C.I and the rate of interest for first year is 9%, 2nd year is 6% and 3rd year is 3% p.a. respectively. Find the sum if the amount in three years is ₹550?

(a) ₹250
(b) ₹300
(c) ₹462.16
(d) ₹350

11. If pi^2= Rs.96 and R = 8% compounded annually then P = _____.

(a) ₹14,000
(b) ₹15,000
(c) ₹16,000
(d) ₹17,000

12. P = ₹5,000 R = 15% T = 4½ using $I = \frac{PTR}{100}$ then I willbe

(a) ₹3,375
(b) ₹3,300
(c) ₹3,735
(d) None of these

13. A sum of money amounts to ₹6,200 in 2 years and ₹7,400 in 3 years as per S.I. then the Principal is.

(a) ₹3,000
(b) ₹3,500
(c) 3,800
(d) None of these

14. The Effective Rate of interest does not depend upon

(a) Amount of Principal
(b) Amount of interest
(c) Number of Conversion periods
(d) None of these

15. In simple interest if the principal is ₹2,000 and the Rate and time are the Roots of the equation $x^2 - 11x + 30 = 0$ then the simple interest is _____

(a) ₹500
(b) ₹600
(c) ₹700
(d) ₹800

16. The certain sum of money became ₹692/– in 2 yrs and ₹800/– in 5 years then the principle Amount is _____

(a) Rs. 520
(b) Rs. 620
(c) Rs. 720
(d) Rs. 820

17. Determine the present value of perpetuity of Rs. 50,000 per month @ Rate of interest 12% p.a. is _____

(a) Rs. 45,00,000
(b) 50,00,000
(c) Rs. 55,00,000
(d) 60,00,000

18. A person wants to lease out a machine costing Rs. 5,00,000 for a 10 year period. It has fixed a rental of Rs. 51,272 per annum payable annually starting from the end of first year. Suppose rate of interest is 10% per annum, compounded annually on which money can be invested. To whom this agreement is favourable?

(a) Favour for lessee (b) Favour for lessor
(c) Not for both (d) Can't be determined

19. Let a person invest a fixed sum at the end of each month in an account paying interest 12% per year compounded monthly. It the future value of this annuity after the 12th payment is Rs. 55,000 then the amount invested every month is?
(a) Rs. 4,8,37 (b) Rs. 4,637
(c) Rs. 4,337 (d) Rs. 3337

20. If $11_{C_X} = 11_{C_{2X-4}}$ **and** $x \neq 4$ **then the value of** 7_{C_X} =
(a) 20 **(b) 21**
(c) 22 (d) 23

21. Which of the following is not a correct statement
(a) $n_{P_n} = n_{P_{n-1}}$ (b) ${}^{n}p_n = 2.{}^{n}p_{n-2}$
(c) $n_{P_n} = 3.n_{P_{n-3}}$ **(d)** $\boldsymbol{n_{P_n} = n.(n-1)_{P_{n-1}}}$

22. If Y = 1+x + x² +.....∞ then x =
(a) $\frac{y-1}{y}$ (b) $\frac{y+1}{y}$
(c) $\frac{y}{y+1}$ (d) $\frac{y}{y-1}$

23. If 2 + 6 + 10 + 14 + 18 + ... + x = 882 then the value of x
(a) 78 (b) 80
(c) 82 (d) 86

24. In a G.P, If the fourth term is '3' then the product of first seven terms is
(a) 3^5 **(b)** 3^7
(c) 3^6 (d) 3^8

25. The Ratio of sum of n terms of the two AP's is (n +1) : (n–1) then the Ratio of their mth terms is
(a) (m + 1) : 2m (b) (m + 1) : (m –1)
(c) (2m –1 :(m + 1) **(d) m : (m – 1)**

26. If *A* = {1,2,3,4,5,6,7,8,9,}
B **= {1,3,4,5,7,8};C = {2,6,8,} then find** (A – B) ∪C =
(a) {2,6,} (b) {2,6,8}
(c) **{2,6,8,9}** (d) None of these

27. If *f* (*x*) = *x*² and $g(x) = \sqrt{x}$ then
(a) go,*f*(3)= 3 (b) go $f(-3) = 9$
(c) go, $f(9) = 3$ (d) go $f(-9) = 3$

28. A= {1,2,3,4, ... 10} a relation on $A, R = \{(x, y)/x + y = 10, x \in A, y \in A, X \geq Y\}$ then Domain of R^{-1} is
(a) {1,2,3,4,5} (b) {0,3,5,7,9}
(c) {1,2,4,5,6,7} (d) None of these

29. If A ={*a, b, c, d*}; B = {*p, q, r ,s*} which of the following relation is a function from A to B
(a) $R_1 = \{(a, p), (b, q), (c, s)\}$
(b) $R_2 = \{(p, a\}, (b, r), (d, s)\}$
(c) $R_3 = \{(b, p), (c, s), (b, r)\}$
(d) R_4 **= {(*a*, p)(*b, r*)(*c, q*), (d, s)}**

30. If $2^x - 2^y = 2^{x-y}$ then $\frac{dy}{dx}$ at $x = y = 2$

(a) 1 (b) 2
(c) 4 (d) 5

31. If the Cost of function of a commodity is given by $C = 150x - 5x^2 + \frac{x^3}{6}$, where C stands for cost and x stands for output. If the average cost is equal to the marginal cost then the output x =

(a) 5 (b) 10
(c) 15 (d) 20

32. $\int_z^3 \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}} dx =$

(a) 1 **(b) ½**
(c) 2 (d) 3/2

33. $\int \log_e(a^x) dx =$

(a) $\log_e a^{\left(\frac{x^2}{2}\right)} + c$ (b) $\log_e a^{\left(\frac{x}{2}\right)} + c$
(c) $x \log a^x - x + c$ (d) $x \log a^x + c$

"LOGICAL REASONING"

41. If in a certain language, MADRAS is code as NBESBT, how is BOMBAY coded in that language?
(a) CPNCBX **(b) CPNCBZ**
(c) CPOCBZ (d) CQOCBZ

42. Which of the following is odd one
(a) CEHL (b) KMPT
(c) OQTX **(d) NPSV**

43. Which of the following is odd one 4, 12, 44, 176, 890 .....
(a) 4 (b) 12
(c) 44 (d) 176

44. 7,23, 47, 119, 167 _____
(a) 211 (b) 223
(c) 287 (d) 319

45. When a person faces north and walk 25 m and she turn left and walk 20m and again turns right and walk 25m, and turns right 25m and turns right and walks 40m in which direction is he now from his starting point.
(a) North – West **(b) North –East**
(c) South – East (d) South – West

46. Madhuri moved a distance of 75 meters toward north. She then turned to the left and walking for about 25m, turned left again and walks 80m, finally she turned to the right at an angle of 45°. In which direction was she moving finally?
(a) South – East (b) South – West
(c) North – west (d) North – East

47. A person facing North 70° clock wise direction moving in clockwise and 300° clock wise direction. Now, in which direction he presently facing.

(a) North-West (b) South-East
(c) North-East (d) Sought-West

48. Sangeetha leaves from her home. She first walks 30 metres in north – west direction, and then 30 m in south west direction, next she walks 30 metres in south – east direction. Finally she turns towards her house. In which direction is she moving

(a) North West **(b) North –East**
(c) South – East (d) South – West

49. Pointing to a photograph, a Man said "His Mother husband's sister is my aunt". Then what is relation between a man and he?

(a) Son (b) Uncle
(c) Nephew **(d) Brother**

50. Pointing to old man Kailash said "his son is my son's uncle" How is kailash is related to old man.

(a) Brother **(b) Either son (or) son-in-law**
(c) Father (d) Grand Father

51. Five boys A, B, C, D, E are sitting in a row A is to the right of B and E is to the left of B but to the right of C. A is to the left of D who is second from the left end?

(a) D (b) A
(c) E (d) B

52. 5 children are sitting in a row. S is sitting next to P but not T.K is sitting next to R.K is sitting on extreme end. T is not sitting next to K. Who are sitting adjacent to S.

(a) K & P (b) R & P
(c) Only P **(d) P & T**

53. Four girls are seated for a photograph. Shikha is left of Reena. Manju is to the right of Reena. Rita is between Reena and Manju. Who is the second left in photograph.

(a) Reena (b) Manji
(c) Rita (d) Shikha

54. Statement I : Some fools are intelligent
Statement II: All intelligent is great
Conclusion I: Some fools are great
Conclusion II: All greats are intelligent

(a) Conclusion I follows (b) Conclusion II follows
(c) Neither I nor Ii follows (d) Either I nor Ii follows

55. Statement I: Sohan is good sports man
Statement II: Sports man is healthy.
Conslusion I: Sohan is healthy
Conclusion II: All sports men are good.

(a) Conclusion I follows (b) Conclusion II follows
(c) Neither I nor II follows (d) Either I nor II follows

"STATISTICS"

61. series is continuous.
(a) Open ended
(b) Exclusive
(c) Close ended
(d) Unequal call intervals

62. Which of the following graph is suitable for cumulative frequency distribution?
(a) Ogives
(b) Histogram
(c) G.M
(d) A.M

63.. Histogram is used for finding
(a) Mode
(b) Mean
(c) First Quartile
(d) None

64. Ogive graph is used for finding
(a) Mean
(b) Mode
(c) Median
(d) None

65. Histogram can be shown as
(a) Ellipse
(b) Rectangle
(c) Hyperbola
(d) Circle

66. The AM of 15 observations is 9 and the AM of first 9 observations is 11 and then AM of remaining observations is
(a) 11
(b) 6
(c) 5
(d) 9

67. In a moderately skewed distribution the values of mean & median are 12 & 18 respectively. The value of mode is
(a) 6
(b) 12
(c) 15
(d) 30

68. Which of the following is positional average?
(a) **Median**
(b) GM
(c) HM
(d) AM

69. For the distribution

X	1	2	3	4	5	6
F	6	9	10	14	12	8

The value of median is
(a) 3.5
(b) 3
(c) 4
(d) 5

70. For a symmetric distribution
(a) **Mean = Median = Mode**
(b) Mode = 3 Median –2 Mean
(c) Mode = $\frac{1}{3}$ Median = ½
(d) None

71. The sum of mean and SD of a series is a+b, if we add 2 to each observation of the series then the sum of mean and SD is
(a) a + b + 2
(b) 6 + a + b
(c) 4 + a – b
(d) a + b + 4

72. Given that

X	-3	-3/2	0	3/2	3
Y	9	9/4	0	9/4	9

The Karipeason's coefficient of correlation is

(a) Positive **(b) Zero**
(c) Negative (d) None

73. If $\sigma^2 = 100$ and coefficient of variation = 20% then $\bar{x} =$

(a) 60 (b) 70
(c) 80 **(d) 50**

74. Coefficient of quartile deviation is ¼ then Q_3/Q_1 is

(a) 5/3 (b) 4/3
(c) ¾ (d) 3/5

75. Standard deviation is_____times of $\sqrt{MD \times QD}$

(a) 2/3 (b) 4/5
(c) $\sqrt{\frac{15}{8}}$ (d) $\sqrt{\frac{8}{15}}$

76. 70. SD of first five consecutive natural numbers is

(a) $\sqrt{10}$ (b) $\sqrt{8}$
(c) $\sqrt{3}$ **(d)** $\sqrt{2}$

77. 71. The Q.D. of 6 numbers 15, 8, 36,40,38,41 is equal to

(a) 12.5 (b) 25
(c) 13.5 (d) 37

78. Given the following series:

X	10	13	12	15	8	15
Y	12	16	18	16	7	18

The rank correlation coefficient r =

(a) $1 - \frac{6\sum d^3 + \sum_{i=d}^{2} \frac{m_i(m_i^2-1)}{12}}{m(n^2-1)}$

(b) $1 - \frac{\left[6\left|\sum d^2 + \sum_{i=1}^{3} \frac{m_i(m_i^2-1)}{12}\right|\right]}{n(n^2-1)}$

(c) $1 - 6\sum d^2 + \sum_{i=1}^{2} \frac{n(n^{21}-1)}{12}$

(d) $1 - 6\sum d^2 + \sum_{i=1}^{3} \frac{n(n^2-1)}{12}$

79. Find the probable error if $r = \frac{2}{\sqrt{10}}$ and n = 36.

(a) 0.6745 **(b) 0.06745**
(c) 0.5287 (d) None

80. If the regression line of y on x is given by Y = x + 2 and Karlpearson's coefficient of correlation is 0.5 then $\frac{\sigma y^2}{\sigma x^2} =$ _____

(a) 3 (b) 2
(c) 4 (d) None

81. A.M. of regression coefficients is

(a) Equal to r **(b) Greater then or equal to r**
(c) Half of r (d) None of these

82. If a coin is Tossed 5 times then the probability of getting Tail and Head occurs alternatively is

(a) $\frac{1}{8}$ **(b)** $\frac{1}{16}$
(c) $\frac{1}{32}$ (d) $\frac{1}{64}$

83. According to bayee's therom,

$P(E_k IA) = \frac{P(E_k)P(A/E_k)}{\sum_{i=1}^{n} P(E_i)P(A/E_i)}$ here

(a) E_1, E_2..... are mutually exclusive
(b) $P(E/A_t), P(E/A_2)$..... are equal to 1
(c) $P(A_t/E), P(A2/E)$..... are equal to 1
(d) A & E_i's are disjoint sets.

84. If mean and variance are 5 and 3 respectively then relation between p & q is

(a) p > q **(b) p < q**
(c) p = q (d) p is symmetric

85. 4 coins were tossed 1600 times. What is the probability that all 4 coins do not turn head upward at a time?

(a) $1600e^{-100}$ (b) $1000e^{-100}$
(c) $100e^{-1600}$ **(d)** e^{-100}

86. For a normal variable, if the first moment about 4 is 6, then the A.M is

(a) 1.5 (b) 2
(c) 10 (d) 24

87. If Y ≥ x then mathematical expectation is

(a) E(X) > E(Y) **(b) E(X) ≤ E(Y)**
(c) E(x) = E(Y) (d) E(X) . E(Y) = 1

88. The prices and quantities of 3 commodities in base and current years are as follows:

P_0	P_1	q_0	q_1
12	14	10	20
10	8	20	30
8	10	30	10

The Laspayer price index is

(a) 118.13 **(b) 107.14**
(c) 120.10 (d) None

89. The cost of living index numbers in years 2015 and 2018 were 97.5 and 115 respectively. The salary of a worker in 2015 was Rs. 19500. How much additional salary was required for him in 2018 to maintain the same statement of living as in 2015?

(a) Rs. 3000 (b) 4,000
(c) 3,500 (d) 4,500

90. Which is called an ideal index number?

(a) Laspayer's index number (b) Pasche's index number
(c) Fisher's index number (d) Marshall Edgeworth index number

91. Trend in semi average is

(a) **Linear** (b) Parabola
(c) Exponential (d) None of these

92. The most commonly used mathematical method for finding secular trend is

(a) Moving average **(b) Semi averages**
(c) Least squares (d) None of these

93. In Semi averages method, if the number of values is odd then we drop:

(a) First value (b) Last value
(c) Middle value (d) Middle two values

BUSINESS MATHEMATICS LOGICAL REASONING & STATISTICS

1	A	11	B	21	D	31	C	41	B	51	C	61	B	71	A	81	B	91	A
2	C	12	A	22	A	32	C	42	D	52	D	62	A	72	B	82	B	92	B
3	C	13	C	23	C	33	A	43	C	53	C	63	A	73	D	83	A	93	C
4	B	14	A	24	B	34		44	C	54	A	64	C	74	A	84	B	94	
5	C	15	B	25	D	35		45	B	55	A	65	B	75	C	85	D	95	
6	B	16	B	26	C	36		46	C	56		66	B	76	D	86	C	96	
7	D	17	B	27	A	37		47	C	57		67	D	77	C	87	B	97	
8	B	18	A	28	A	38		48	B	58		68	A	78	B	88	B	98	
9	D	19	C	29	D	39		49	D	59		69	C	79	B	89	C	99	
10	C	20	B	30	A	40		50	B	60		70	A	80	C	90	C	100	

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NOV 2019

"BUSINESS MATHEMATICS "

1 **The two numbers are in ratio 3 : 4. The difference between their squares is 28. Find the greater number.**

(a) 12 **(b) 8**
(c) 16 (d) 10

2. **If** $\left[\frac{9^{n+\frac{1}{4}}\cdot\sqrt{3.3^n}}{3.\sqrt{3^{-n}}}\right]^{\frac{1}{n}}$

(a) 1 (b) 3
(c) 9 **(d) 27**

3. **If** $x=\sqrt{3}+\frac{1}{\sqrt{3}}$ **then** $\left(x-\frac{\sqrt{126}}{\sqrt{42}}\right)\left(x-\frac{1}{x-\frac{2\sqrt{8}}{5}}\right)$ =

(a) $\frac{5}{6}$ (b) $\frac{6}{5}$
(c) $\frac{2}{3}$ (d) $-\frac{3}{5}$

4. **If** $x=\frac{1}{5+2\sqrt{6}}$ **then the value of the expression** $x^2-10x+1$ **is**

(a) 0 (b) 10
(c) $26-12\sqrt{2}$ (d) $\sqrt{15}+\sqrt{3}$

5 $\log_{0.01}(10{,}000) = x$; **Find the value of x?**

(a) 1 **(b) – 2**
(c) – 4 (d) 2

6 $\log xy^2 - \log y = \log(x+y)$ **Find the value of y in term of x**

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

7 **Find the root of the equations. if** $4^x \cdot 8^y = 128$ **and** $3^x/27^y = 1/3$

(a) 2, 1 (b) –2, 1
(c) 2, –1 (d) 1, 2

8 **The three roots of equation is.** $x^3+9x^2-x-9=0$

(a) 1,-1,-9 (b) 1,-1,9
(c) 1,1,9 (d) -1,-1,-9

9 **Find the value of K so that x =2 is a root of the equation** $3x^2 - 2kx + 5 = 0$

(a) 17/4 (b) 4/17
(c) –17/4 (d) –4/17

10 **The solutions of the set of inequations** $2x+y \geq 12$, $5x + 8y \geq 74$, $x + 6y \geq 24$, $x \geq 0$, $y \geq 0$ **are**

(a) (24,. 0), $\left(\frac{126}{11},\frac{23}{11}\right), (2, 8)(0, 12)$ (b) $(0, 24), (2, 8), (0, 12), \left(\frac{126}{11},\frac{23}{11}\right)$
(c) (8, 4), (2, 8), (0, 12), (0, 24) (d) (8,4), (0, 0) (0,6) (2,0)

11 **The present value of a scooter is ` 7290. The rate of depreciation is 10%. What was its value 3 years ago?**
(a) 10,000 (b) 10010
(c) 9990 (d) 12000

12 **The difference between compound interest, compounded semi annually and simple interest on `400 at 10% p.a. for one year.**
**(a) ` 1** (b) ` 28
(c) ` 35 (d) ` 40

13. **If the interest of a money is equal to its one by nine, the rate of interest and time are equal then find rate of interest is.**
(a) $3\frac{1}{3}\%$ (b) 4½%
(c) 3% (d) 3.5%

14. **1/7 of a money is deposited at 4% per annum , ½ of a money deposited at 5% per annum and the remaining at the rate of 6%, then total interest gained `730 find deposit amount is**
**(a) ` 14000** (b) `15500
(c) `12800 (d) `14500

15. **Ram deposited `12000 in a bank at 10% per annum and remaining amount deposit in other bank at 20% per annum. if he received interest according to 14% per annum find the Ram's amount.**
**(a) `20000** (b) `22000
(c) `30000 (d) `25000

16 **In how much time the S.I. on a certain sum becomes 0.125 times to its principle at 10% p.a. is**
(a) 1.00 yrs **(b) 1.25 yrs**
(c) 1.50 yrs (d) 2.00 yrs

17 **If the difference between interest received by two persons A and B on the same sum of `1500 for 3 years Rs. 18. Then what is the difference between the two rates of interest.**
(a) 1% (b) 2.5%
(c) % **(d) 0.4%**

18 **In what time will a sum Rs. 800 amounts to Rs. 882 at 5% p.a. compounded annually**
(a) 1 yrs **(b) 2 yrs**
(c) 3 yrs (d) 4 yrs

19. **If the compound interest on a certain sum for 2 years at 3% p.a. is `1015. What would be the simple interest on the sum at the same rate and same time is**
(a) 1005 (b) 1010
(c) 1000 (d) 1003

20 **The useful life of a machine whose cost is ` 10,000 is 10 years. If it depreciates at 10% p.a. then the scrap value of the machine is.**
(a) 3486.70 (b) 3158.30
(c) 3500 (d) 7033

21 **Find the effective rate of interest if an amount of `30,000 deposited in a bank. For 1 year at the rate of 10% p.a. compounded semi annually.**
(a) 10.05% (b) 10.10%
(c) 10.20% **(d) 10.25%**

22 **The present population of a town is 25,000. If it grows at the rate of 4%, 5%, 8% during 1st year, 2nd year, 3rd year respectively. Then find the population after 3 years.**
(a) 29,484 (b) 29,844
(c) 29,448 (d) 28,944

23 **An amount 35000 with the rate of interest is 7% per annum, it is compounded on a monthly basis, then tell the effective rate of interest.**
(a) 7.22% (b) 7.64%
(c) 7.0%. (d) 7.5%

24 **Find the future value of annuity of `500 is made annually for 7 years interest rate of 14% compound at annually. Given that $(1.14)^7 = 2.5023$**
(a) `5635.35 **(b) `5365.35**
(c) `6535.35 (d) `6355.35

25 **How many number divisible by 5 of 6 digit can be made from the digit 2, 3, 4, 5, 6, 7**
(a) 120 (b) 600
(c) 240 (d) none

26 **5 boys and 3 girls are to be seated together such that no two girls are together**
(a) 14,400 (b) 2400
(c) 720 (d) None of these

27 **Out of 6 Boys & 4 girls, Find the number of ways for selecting 5 member committee in which there is exactly two girls ?**
(a) 120 (b) 1440
(c) 720 (d) 71

28 **if $^nP_5 : {}^nP_3$ is 2:1 than value of n is**
(a) 2 (b) -5
(c) -2 **(d) 5**

29 **In the series 25, 5, 1, ... 1/3125 which term is 1/3125?**
(a) 8th term (b) 9th term
(c) 15th term (d) None of these

30 **The sum of five terms of AP is 75 find the 3rd term is.**
(a) 20 (b) 30
(c) 15 (d) None of these

31 **(c+a-b)/b, (a+b-c)/c, (b+c-a)/a are in AP then a,b,c are in**
(a) AP (b) GP
(c) HP (d) None of these

32 **The sum of series $1/2+1/3^2+1/2^3+1/3^4$..... up to infinity is**
(a) 25/24 **(b) 19/24**
(c) 1/12 (d) None of these

33 $f(x) = \begin{cases} x, & x < 0 \\ 0, & x = 0 \\ x^2, & x > 0 \end{cases}$ **then find**
$\lim_{x \to 0} f(x)$
(a) 1 **(b) 0**
(c) –2 (d) 2

34 $f(x) = f(x-1)+f(x-2)$ if f (0)= 0, f(1) = 1, x = 2, 3, 4,.....then what is $f(7)$

(a) 8 **(b) 13**
(c) 3 (d) 5

35 $f(x) = 2x^3+1$ then what is $f^{-1}(x)$ options

(a) ½ $(x-1)^{1/3}$ **(b)** $\left(\frac{x-1}{2}\right)^{1/3}$
(c) $\left(\frac{x-1}{2}\right)^{1/2}$ (d) None of these

36 Find the value of dy/dx if $y=x^x$

(a) x^xlogex (b) 1+logx
(c) ylogx (d) none of these

37 Find the value of $\int xe^x\,dx$

(a) e^x(x-1)+c (a) e^x(2x-1)+c
(a) e^x(x-1) (d) None of these

38 If $f(x) = a(x^2 + x + 1)^2$ and $f^1(-1) = -6$ then the value of a =

(a) 1 (b) 2
(c) 3 (d) 4

39 Find the value of $\int (4x+5)^6\,dx$ is equal to

(a) 1/7(4x+5)⁷+ c **(b) 1/28(4x+5)⁷+ c**
(c) 1/4(4x+5)⁷+ c (d) None of these

40 $\int_{-1}^{1}(2x^3-x^3)dx =$

(a) 14 (b) 104
(c) $\frac{2x^3}{3}-\frac{x^4}{4}$ **(d)** $\frac{4}{3}$

41 Find odd one out; 1, 5, 14, 30, 51, 55, 91, ?

(a) 14 (b) 55
(c) 51 (d) 91

42 Find odd one out ; 5, 10, 17, 27, 37, 50, 65 ?

(a) 17 **(b) 27**
(c) 37 (d) 65

43 Find the missing figures; 4, 16, 36, 64, 100 ?

(a) 92 (b) 121
(c) 144 (d) 169

44 If "SYSTEM" be coded 131625; then 'TERMS' may be coded as :—

(a) 62251 **(b) 62451**
(c) 64951 (d) 62415

45 If "MADRAS" written as "NBESBT"; then "DELHI" may be coded as:—

(a) EMTIF **(b) EFMIJ**
(c) JEMFT (d) EEMJI

46. A man started walking West. He turned right. Then again and finally turned left. Towards which direction was he walking now?

(a) North (b) South
(c) West (d) East

47. **A starts form a point and walk 2 km north, then turns left and walk 1 km, then again turns left and walks 2 km. Point out the direction in which he is going now?**
(a) East (b) West
(c) North **(d) South**

48. **A man is moving on cycle and move 4 km South then turns left and move 2km and turns again to the right to move to go more. In which direction is he moving?**
(a) North (b) West
(c) East **(d) South**

49. **If Mohan travels towards north from his house then turn to left, then to south coving equal distance. In each direction to reach Sohan's house. In which direction Mohan's house is form Sohan's house now?**
(a) East (b) South
(c) North (d) West

50. **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**

51. **A man takes his dog for a walk whose house is facing East. He walks first towards west and then walks towards south. In which direction he has to walk now to reach home?**
(a) North East (b) West
(c) South (d) North West

52 **5 persons are standing in a line one of the 2 persons at the extreme ends is a professor and the other a business man. An advocate is standing to the right of student. An author is to the left of the business man. The student is standing between the professor and advocate. Counting from the left. The author is at which place?**
(a) 2nd (b) 3rd
(c) 4th (d) None of these

53 **Parikh is sitting between narendra and babita, charu is to the left of babita, pankaj she's sitting between charu and ashma they all sitting around a circle facing the center then who is sitting to the right of babita?**
(a) Parikh (b) Ashma
(c) Charu (d) Narendr

Direction (Q. 54-57) Read the following information carefully to answer the give questions.
Six members of a family namely A, B, C, D, E and F are travelling together. 'B' is the son of C but C is not the mother of B. A and C are married couple. E is the brother of C. D is the daughter of A. F is the brother of B.

54 **How many male members are there in the family?**
(a) 3 (b) 2
(c) 4 (d) 1

55 **How many children does A have**
(a) 1 (b) 2
(c) 3 (d) 4

56 **What is the relation of E to D**
(a) Uncle (b) Brother
(c) Father (d) None of these

57 **Who is the mother of B?**
(a) C (b) D
(c) F **(d) A**

Direction (Q. 58-60)
In each question below are three statements followed by four conclusions numbered I, II, III and IV. You have to take the three given statements to be true even, if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follows from the three statements disregarding commonly known facts:

58. **Statements:**
I. Some fruits are rivers II. Some rivers are boats
III. Some rivers are fruits IV. Some flowers are fruits
(a) Only I & III follows (b) Only II & III follows
(c) Only II & IV follows (d) All follows

59. **Statements:**
All buildings are Rings
All papers are buildings
All dogs are papers
Conclusions :
I. All dogs are rains II. Some papers are rains
III. Some rains are buildings IV. Some rains are papers
(a) Only I & II follows (b) Only II & III follows
(c) Only I, III, IV follows **(d) All follows**

60. **Statements:**
Some flowers are rods
Some rods are doors
Some doors are houses
Conclusions:
I. Some houses are flowers II. Some doors are flowers
III. Some flowers are doors IV. No house is flower
(a) Either I or II follows **(b) Either I or IV follows**
(c) Only II & III follows (d) Only I & IV follows

61 **Histogram is used for presentation of the following type of series.**
(a) Time Services
(b) Continuous Frequency Series
(c) Discrete Series
(d) Individual Series

62 **The graphical representation of cumulative frequency distribution is called–**
(a) Histogram (b) Pie Chart
(c) Frequency Polygon **(d) Ogive**

63

No. of Accidents	0	1	2	3	4	5	6	7
Frequency	36	27	33	29	24	27	18	9

In how many cases 4 or more accidents occur ?
(a) 96 (b) 133
(c) 78 (d) 54

64. **The difference between upper limit and lower limit of a class is called:**
(a) Class interval (b) Class boundaries
(c) Mid-value (d) Frequency

65 $\sum_{i=1}^{m}(x-\bar{x}) = ?$

(a) 1 **(b) 0**
(c) −1 (d) None of these

66 **The median of the following frequency distribution is equal to**

X :	5	7	9	12	14	17	19	21
Y :	6	5	3	6	5	3	2	4

(a) 6 **(b) 12**
(c) 13 (d) 14

67 **Find median from the following data:**

Marks	0–10	10-30	30-60	60-80	80-90
No. of students	5	15	30	8	2

(a) 8 (b) 30
(c) 40 (d) 45

68 **Find the mode from the following data:**

Class :	3–6	6–9	9–12	12–15	15–18	18–21	21–24
Frequency	2	5	10	23	21	12	3

(a) 23 (b) 13.3
(c) 12.6 **(d) 14.6**

69 **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

70 **The arithmetic mean of two numbers is 30 and geometric mean is 24 find the two number**

(a) 12 and 48 (b) 14 and 46
(c) 10 and 50 (d) 16 and 44

71 **Sum of the squares of deviations is minimum when deviations are taken from**

(a) Mean (b) Median
(c) Mode (d) An arbitrary value

72 **What will be the probable value of mean deviation when $Q_3 = 40$ and $Q_1 = 15$?**

(a) 17.50 (b) 18.75
(c) 15.00 (d) 16.00

73 **Find the mean deviation about mean of 4,5,6,8,3**

(a) 5.20 (b) 7.20
(c) 1.44 (d) 2.33

74 **The mean and coefficiente of variance is 20 and 80 find the value of variance**

(a) 16 **(b) 256**
(c) 36 (d) none

75 **Find SD of 1, 2, 3,4, 5,6, 7, 8,9**

(a) $\sqrt{\frac{20}{3}}$ (b) $\sqrt{\frac{81}{3}}$

(c) $\sqrt{\frac{20}{5}}$ (d) None of these

76 **The standard deviation for the set of numbers 1,4,5,7,8, is 2.45 nearly. If 10 is added to each number then new standard deviation is**

(a) 24.45 (b) 12.45

(c) 2.45 (d) 0.245

77 **If every observation is increased by 5 then:**

(a) SD increase by 5 (b) MD increased by 5

(c) QD increases by 5 **(d) None affected**

78 **For a given distribution the arithmetic mean is 15 and the standard deviation is 9 then the coefficient of variation is equal to**

(a) $\frac{15}{9} \times 100$ (b) $\frac{15}{9}$

(c) $\frac{9}{15}$ **(d)** $\frac{9}{15} \times 100$

79 **The mean of a distribution is 14 and the standard deviation is 5. What is the value of the coefficient of variation?**

(a) 60.4% (b) 70%

(c) 35.7% (d) 27.8%

80 **If the equation of the two regression lines are 2x – 3y = 0 and 4y –5x = 8 then the correlation coefficient between x and y is equal to**

(a) $\sqrt{\frac{15}{8}}$ **(b)** $\sqrt{\frac{8}{15}}$

(c) $\sqrt{\frac{6}{15}}$ (d) $\sqrt{\frac{1}{15}}$

81 **Find correlation coefficient**

X 5 4 3 2 1

Y 1 2 3 4 5

(a) 1 **(b) 1**

(c) 0 (d) None of these

82 **If scatter diagram from a line move from lower left to upper right corner then the correlation is.**

(a) Perfect positive (b) Perfect negative

(c) Simple positive (d) No correlation

83 **Consider to regression line 3x+2y=26, 6x+y=31 find the correlation coefficient between x and y**

(a) 0.5 **(b) -0.5**

(c) 0.25 (d) -0.25

84 **If correlation coefficient between x and y is 0.5 thenFind the corlication coefficient between 2x –3 and 3–5y is**

(a) 0.5 **(b) –0.5**

(c) 2.5 (d) –2.5

85 **If two letters are taken at random from the word HOME, what is the Probability that none of the letters would be vowels :**

(a) 1/6 (b) 1/2
(c) 1/3 (d) 1/4

86 **A bag contains 15 one rupee coins, 25 two rupee coins and 10 five rupee coins. If a coin is selected at random from the bag, then the probability of not selecting a one rupee coin is :**

(a) 0.30 **(b) 0.70**
(c) 0.25 (d) 0.20

87 **The chance of getting 7 or 11 in a throw of 2 dice is**

(a) 7/9 (b 5/9
(c) 2/9 (d) None of these

88 **In normal distribution what is the ratio of QD:MD:SD**

(a) 12:10:15 (b) 15:10:12
(c) 10:15;12 **(d) 10:12:15**

89 **For a normal distribution $\sqrt{\frac{2}{\pi}}e^{-2(x-3)^2}$ mean and standard deviation will be–**

(a) 3, ½ (b) $3, \frac{1}{\sqrt{2}}$
(c) $3, \sqrt{2}$ (d) None of these

90 **Area covered normal curve by $(\mu \pm 3\sigma)$**

(a) 68.28% (b) 95.96%
(c) 99.73% (d) 99.23%

91 **If x is binomial variate with parameter 15 and 1/3 what is the value of mode of the distribution**

(a) 5 & 6 (b) 5.5
(c) 5 (d) 6

92 **In poisson distribution which of the following is same.**

(a) Mean and variance (b) Mean and SD
(c) Both (d) None of these

93 **If for a binomial distribution B(n,p), ;n = 4 and also P(x=2) =3 P(x=3) then the value of P is equal to**

(a) $\frac{9}{11}$ (b) 1
(c) $\frac{1}{3}$ (d) $\frac{1}{9}$

94 **Let x be a poisson random variable with parameter λ. Then p(x) is equal to**

(a) $\frac{e^{\lambda}-e^{-\lambda}}{2}$ (b) $\frac{e^{\lambda}+e^{-\lambda}}{2}$
(c) $\frac{e^{2\lambda}-1}{2}$ **(d)** $\frac{1-e^{2\lambda}}{2}$

95 **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

96 **The value of the base time period serves as a standard point of comparison.**
(a) True (b) False
(c) Both (d) None of these

97 **Fisher's ideal formula does not satisfy _____test?**
(a) Unit test **(b) circular test**
(c) Time reversal test (d) None of these

98 **In semi average method, if the no. of value is odd then we drop.**
(a) First term (b) Last term
(c) Middle term (d) None of these

99 **The sale of cold drink could go up in summers and go down in the winters is an example of**
(a) Secular trend **(b) Seasonal variation**
(c) Cyclical variation (d) Irregular variation

100 **Seasonal variations can occurrence within a period of**
(a) 4 year (b) 3 year
(c) 1 year (d) 9 year

Answer key

1	B	21	D	41	C	61	B	81	B
2	D	22	A	42	B	62	D	82	A
3	A	23	A	43	C	63	C	83	B
4	A	24	B	44	B	64	A	84	B
5	B	25	A	45	B	65	B	85	A
6	C	26	A	46	A	66	B	86	B
7	A	27	A	47	D	67	C	87	C
8	A	28	D	48	D	68	D	88	D
9	A	29	A	49	A	69	B	89	A
10	A	30	C	50	D	70	A	90	C
11	A	31	C	51	A	71	A	91	C
12	A	32	B	52	C	72	C	92	A
13	A	33	B	53	A	73	C	93	C
14	A	34	B	54	C	74	B	94	D
15	A	35	B	55	C	75	A	95	C
16	B	36	A	56	A	76	C	96	A
17	D	37	A	57	D	77	D	97	B
18	B	38	C	58	C	78	D	98	C
19	A	39	B	59	D	79	C	99	B
20	C	40	D	60	B	80	B	100	C

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DEC 2020

CA Foundation

Business Mathematics Statistics and Logical Reasoning

December -2020 Exam Paper

1. The average cost function of a good is $2Q + 6 + \frac{13}{Q}$, where Q is the quantity produced. The approx cost as Q =15 is_____.

(a) 36 (b) 42

(c) 66 (d) 130

2. Find the missing value in the series 0, 2, 3, 6, 10, 17, 28, ___75.

(a) 46 (b) 58

(c) 48 (d) 54

3. On what sum will the compound interest at 5% per annum for 2 compounded annually be Rs3,280?

(a) Rs 32,000 (b) Rs 16,000

(c) Rs 48,000 (d) Rs 64,000

4. What sum of money will produce Rs 42,000 as an interest in 3 years and 3 months at 2.5% P.a. simple interest ?

(a) Rs 5,26,769 (b) Rs 3,78,000

(c) Rs 4,22,000 (d) Rs 2,24,000

5. Two finite sets respectively have x and y number of elements. The total number of subsets of the first is 56 more than the total number of subsets of the second. The value of x and y respectively:

(a) 6 and 3 (b) 4 and 2

(c) 2 and 4 (d) 3 and 6

6. The number of items in the set A is 40; in the set B is 32; in the set C is 50: in both A and B is 4 in both A and C and is 5: in both B and C is 7: in all the sets 2 How many are in only one set ?

(a) 110 (b) 65

(c) 106 (d) 84

7. A fruit basket contains 7 apples , 6 bananas and 4 mangoes. How many selections of 3 fruits can be made so that all 3 are apples?

(a) 35 ways (b) 120 ways

(c) 165 ways (d) 70 ways

8. Out of 7 boys and 4 girls a team of a debate club of 5 is to be chosen The number of teams such that each team includes at least one girls is _

(a) 439 (b) 429

(c) 419 (d) 441

9. if p $\frac{?}{4}$=20 , P $\frac{?}{2}$,when p decotes the numbers of permutations n= _____

(a) 2 (b) 4

(c) 5 (d) 7

10. From a group of 8 men and 4 women, 4 persons are to be selected to form a committee so that at least 2 women are there on the committee in how many ways can it be done ?

(a) 168 (b) 201

(c) 202 (d) 220

11. Three numbers in G.p. with their sum 130 and their product 27,000 are-

(a) 10,30, 90 (b) 90, 30, 10

(c) (A) & (B) Both (d) 10,20,30

12. The set of cubes of the natural numbers is-

(a) A null set

(b) A finite set

(c) An infinite set

(d) A finite set of the three numbers

13. Divide 69 into three parts which are in A.P. and are such that the product of the first two parts is 460 .

Of f

(c) 19, 23, 27, (d) 22, 23, 24,

14. The inverse function f^1 of f(y) = 3y is –

(a) y/3 (b) 1/3y

(c) -3y (d) 1/y

15. The 20^{th} term of arithmetic progression whose 6^{th} term is 38 and 10^{th}term is 66 is _____.

(a) 118 (b) 136

(c) 178 (d) 210

16. Find the missing value in 3/8, 8/19, 18/41, 7, 78/173

(a) 37/84 (b) 40/87

(c) 39/86 (d) 38/85

17. Find the wrong term in:

G4t,ji0R, M20p, P4jN,S90L

(a) M20p (b) P4jN

(c) ji0R (d) G4t

18. If health is written as IFBMUL, then how will NORTH be written in that code?

(a) OPSUL (b)GSQNM

(c) FRPML (d) IUPSO

19. Which of the following is odd one?

6, 9, 15, 21, 24, 26, 30

(a) 30 (b) 24

(c) 26 (d) 9

20. If y-x(xr-2) then dy/dx is

(a) $3x^2$-6x+2 (b) -6x

(c) 6x+2 (d) 3x-6

21. One day , Ram left home and cycled 10 km southward, turned right and cycled 5 km and turned right and cycled 10 km and turned left and cycled 10 km. How many kilometers will he have to cycle to reach his home straight?

(a) 10 (b) 15

(c) 20 (d) 25

22. 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

23. 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 to the left of I

(c) H is to the right of K (d) H is to the left of G

24. Eight friends I, J, K, L, M, N, O and P are sitting in a circle facing the centre. J is sitting between O and L; P is third to the left of J and second to the right of I; K is sitting between I and O; J & M are not sitting opposite to each other. Which of the following statement is NOT correct?

(a) K is sitting third to the right of L

(b) I is sitting between K and N

(c) L and I are sitting opposite to each other

(d) M is sitting between N and L

25. A man can walk by having long, medium and short steps. Sixty meters can be covered by 100 long steps; 100 meters can be covered by 200 medium steps and 80 meters can be covered

by 200 short steps. He walks taking 5000 long steps; then turn to his left and walk taking 6000 medium steps. He turn to his right and walks by taking 2,500 short steps. How far (in meters) is he away from his starting point?

(a) 4000 m (b) 5000 m

(c) 6000 m (d) 7000 m

26. Read the following information carefully and answer the question below. In a family of six persons A, C, E, F, I, K there are two married couples. G is grandmother of A and mother C. E is wife of C and mother of K. K is the granddaughter of I. What is E to A?

(a) Daughter (b) Mother

(c) Grandmother (d) Aunt

27. Pointing towards a person, a man said to woman, "His mother is the only daughter of your father." How is the woman related to that person?

(a) Mother (b) Daughter

(c) Sister (d) Wife

28. Vicky introduces John as the son of the only brother of his father's wife. How is Vicky related to John?

(a) Son (b) Cousin

(c) Uncle (d) Brother

29. A can said to a lady "your mother's husband's sister is my aunt." How is the man related to the lady?

(a) Father (b) Grandfather

(c) Son (d) Brother

30. If you are facing north – east and move 10 m forward, man left and move 7.5 m, then you are

(a) North of your initial position (b) South of your initial position

(c) East of your initial position (d) None of the option.

31. **Statements :** Some cars are towns.

Some towns are flowers.

All plants are flowers.

Conclusions:

(I) No plant is a car
(II) Some cars are flowers.

Choose the correct answer from the following:

(a) If only conclusion (I) follows
(b) If only conclusion (II) follows
(c) If either (I) or (II) follows
(d) If neither (I) nor (II) follows

32. **Statements:** All huts are flats.

No flat is a building.

All buildings are cottages.

Conclusions:

(I) No hut is a cottage
(II) Some buildings are huts

Choose the correct answer from the following:

(a) If only conclusion (I) follows
(b) If only conclusion (II) follows
(c) If either (I) or (II) follows
(d) If neither (I) nor (II) follows

33. Rahim faces towards north. Turning to his right, he walks 25 m. He then turns to his left and walks 30 m test, he moves 25 m to his right. He then turns to his right again and walks 55 m. Finally, he turns to the right and moves 40 m. in which direction is he now from her starting point?

(a) South – West
(b) South
(c) North – West
(d) South – East

34. Pointing to a lady, A said " that women is my nephew's material grandmother." How is that women related to A's sister who has no sister ?

(a) Cousin (b) Son-in-law

(c) Mother (d) Mother-in-law

35. Pointing out to a lady, Sahil said, "She is the daughter of the woman who is the mother of the husband of my mother." Who is the lady to Sahil?

(a) Aunt (b) Sister

(c) Daughter (d) Sister-in-law

36. Sweetness of a sweet dish is –

(a) An attribute

(b) A discrete variable

(c) A continuous variable

(d) A variable

37. Five auditors of your firm had reported their incomes. You compound their average and obtained Rs.67,000 per month. You now state that the average income per month of all the auditors of your firm is Rs.67,000. This is an example of _____statistics.

(a) Descriptive (b) Inferential

(c) Detailed (d) Non- detailed

38. The harmonic mean A and B is 1/3 and harmonic mean of C and D is 1/5. The harmonic mean of A, B, C and D is

(a) 8/15 (b) ¼

(c) 1/15 (d) 5/3

39. Statistics cannot deal with _____data.

(a) Quantitative (b) Qualitative

(c) Textual (d) Attribute

40. Given that for a distribution the mean, median and mode are 23, 24 and 25.5. it is most likely that the distribution is _____skewed.

(a) Positively (b) Symmetrically

(c) A symptotically (d) Negatively

41. Choose the one from the following which is not a measure of scatter in data

(a) Half range (b) Average of first and third quartiles

(c) Average of squared deviations (d) Average of absolute deviations

42. Two years ago, a team of four persons had an average age of 14. Now, a new member is added to the team and the average age of the team is 17. What is the age of the new member?

(a) 17 (b) 19

(c) 21 (d) 23

43. The number of types of cumulative frequency is –

(a) 1 (b) 2

(c) 3 (d) 4

44. For open – end classification, which of the following is the best measure of central tendency

(a) AM (b) GM

(c) Median (d) Mode

45. The numbers of times city had mild, medium and heavy rains, respectively are 17, 10 and 5. Which of the following represent it?

(a) {17, 10, 5} (b) Quantitative

(c) Continuous (d) Average

46. A fire engine rush to a place of fire at a speed of 70 kmph and after the work, it returned to the base at a speed of 35 kmph. The average speed per hour per direction is obtained as_____ speeds

(a) Average (b) Harmonic means of

(c) Geometric mean of (d) Half of harmonic mean of

47. The _____are used when one wants to visually exercise the relationship between two variables.

(a) Bar graphs (b) Pie charts

(c) Line charts (d) Scanner platter

48. When data are classified according to one criterion, then it is called _____ classification

(a) Quantitative (b) Qualitative

(c) Simple (d) Factored

49. Which measure of dispersion is based on the absolute deviations only?

(a) Range (b) Standard deviation

(c) Mean Deviation (d) Quartile deviation

50. A cricketer's run scores of last ten test matches are available. Statistics cannot be used to find the

(a) Least score (b) Largest score

(c) Best score (d) Median score

51. The person A speaks truth is 71% of times and B in 40% of times. In what percentage of times are very likely to contradict each other in arresting the same incident?

(a) 0.60 (b) 0.0

(c) 0.65 (d) 0.35

52. A basket contains 15 apples, 25 mangoes and 10 bananas. If a fruit is selected at random from the basket, then the probability of not selecting an apple in –

(a) 0.20 (b) 0.25

(c) 0.30 (d) 0.

53. If an unbiased coin is tossed twice, the probability of obtaining at least one tail is –

(a) 1 (b) 0.5

(c) 0.75 (d) 0.25

54. When three fair dice are rolled simultaneously. What is the probability of getting a number on third die greater than die greater than the sum of numbers appeared on the first two dice?

(a) 12/216 (b) 21/216

(c) 36/216 (d) 41/216

55. Two fair dice are rolled simultaneously. What is the probability of getting a sum of the outcomes from the dice is a multiple of 3?

(a) 4/36 (b) 12/36

(c) 6/36 (d) 9/36

56. If we change the parameter(s) of _____distributions, the shape of the probability curve does not change.

(a) Normal (b) Binomial

(c) Poisson (d) Non – Gaussian

57. Which one of the following is uniparametric distribution ?

(a) Poisson (b) Normal

(c) Binomial (d) Hyper geometric

58. For a Poisson distributed variable X, we have P[X = 7] = 8. P[X = 9] the mean of the distribution is

(a) 3 (b) 4

(c) 7 (d) 9

59. The quartile deviation of a normal distribution, mean 10 and standard deviation 4 is –

(a) .20 (b) 54.24

(c) 0.275 (d) 2.70

60. If the probability for success in distribution is less than one-half, then the binomial distribution

(a) is skewed to right (b) is skewed to left

(c) has two modes (d) has median at a point > mean + ½

61. Scatter diagram does not help us to

(a) identify whether variables are correlated or not

(b) find the type of correlation

(c) determine the linear or non linear tyoe

(d) find the numerical value of the correlation coefficient.

62. Which of the following is spurious correlation?

(a) Negative correlation

(b) Correlation between 2 variables having no causal relation

(c) Bad relation between 2 variables

(d) very low correlation between 2 variables

63. The weight for numbers 1, 2, ..., n is respectively 1^2, 2^2, 3^2, ...N^2. The weighted harmonic mean is _____

(a) (2n + 1)/6 (b) (2n + 1)/4

(c)(2n + a)/3 (d) (2n + 1)/2

64. Index numbers are expressed as _____.

(a) Ratios (b) Squares

(c)Percentages (d) Combinations

65. Census reports used as a source of data is _____ data.

(a) Primary (b) Secondary

(c) Organized (d) Confidential

66. Two values yield an arithmetic mean of 24 and a harmonic mean of 6. The geometric mean of these values is _____.

(a) 8 (b) 12

(c) 14 (d) 16

67. Decomposition of time series is known as –

(a) Histogram (b) Detrending

(c) Analysis of time series (d) Historiagram

68. In time series seasonal variations can occur within a period of :

(a) One year (b) Three years

(c) Nine years (d) Five years

69. Fisher's ideal index number does not satisfy _____test.

(a) Time reversal (b) Circular

(c) Factor reversal (d) Unit

70. If Laspeyre's index number = 110. Fisher's ideal index number is 109, then Paasche's index number is _____.

(a) 118 (b) 110

(c) 109 (d) 108

71. A plotted time series throws a periodic variation such that the recurrence period is more than one year. Hence the time series has _____variation.

(a) Irregular (b) Seasonal

(c) Cyclical (d) Long term

72. The covariance between two variables is

(a) Strictly positive (b) Strictly negative

(c) Always zero (d) Either positive or negative or zero

73. Which one of the following has Poisson distribution?

(a) The number of defects per meter on long roll of coated polythene sheet.

(b) The number of days to get a complete cure.

(c) The errors obtained in repeated measuring of the length of a rod.

(d) The number of claims rejected by an insurance agency.

74. A partially legible working sheet for the calculation of rank correlation coefficient revealed that the coefficient of Rank correlation is 1/3 and the sum of squared differences of ranks is 80. What is the number of observations?

(a) 9 (b) 8

(c) 7 (d) 6

75. The fifth percentile can be compared from

(a) Mode (b) Interquartile range

(c) Median (d) Average of first and third quartiles.

76. If a : b = 3 : 7, then 3a + 2b : 4a + 5b = ?

(a) 23 : 47 (b) 27 : 43

(c) 24 : 51 (d) 29 : 53

77. If $\log_a\sqrt{3}$ - 1/6, find the value of a

(a) 9 (b) 81

(c) 27 (d) 3

78. log 9 + log 5 is expressed as –

(a) log 4 (b) log 9/5

(c) log 5/9 (d) log 45

79. If a : b = 9 : 4, then $\sqrt{\frac{a}{b}}+\sqrt{\frac{b}{a}}$=?

(a) $\frac{3}{2}$ (b) $\frac{2}{3}$

(c) $\frac{6}{13}$ (d) $\frac{13}{6}$

80. The ratio of number of boys and the number of girls in a school is found to be 15 : 32. How many boys and equal number of girls should be added to bring the ratio to 2/3?

(a) 19 (b) 20

(c) 23 (d) 27

81. The rational root of the equation $0 = 2p^3 - p^2 - 4n + 2$ is

(a) 2 (b) -2

(c) ½ (d) -1/2

82. Transpose of a row matrix is

(a) Column matrix (b) Zero matrix

(c) Row matrix (d) Diagonal matrix

83. If $2x^2 - (a + 6)2x + 12a - 0$, then the roots are

(a) 6 and a (b) 4 and a^2

(c) 3 and 2a (d) 6 and 3a

84. If $A^3 - \begin{bmatrix} 0 & -i \\ -i & 0 \end{bmatrix}$ and $A^4 - \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, where $i^2 = -1$, then $A^2 =$ _____.

(a) $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} -i & 0 \\ 0 & -i \end{bmatrix}$

(c) $\begin{bmatrix} 0 & -1 \\ -i & 0 \end{bmatrix}$ (d) $\begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$

85. Find the value of a from the following: $(\sqrt{9})^{-5} \times (\sqrt{3})^{-7} - (\sqrt{3})^{-a}$

(a) 11 (b) 13

(c) 15 (d) 17

86. Solving equation $m + \sqrt{m} = 6/25$ the value of m works out to

(a) 1/25 (b) 2/25

(c) 3/25 (d) 1

87. The ratio of principal and the compound interest value for three years (compounded annually) is 216 : 127. The rate of interest is

(a) 0.1777 (b) 0.1567

(c) 0.1666 (d) 0.1588

88. An amount P becomes Rs.5,100.5and Rs. 5,203 after second and fourth years respectively at 1% of interest per annum compounded annually. Thus, values of P and r are

(a) Rs.4,000 and 1.5 (b) Rs.5,000 and 1

(c) Rs.6,000 and 2 (d) Rs.5,500 and 3

89. A certain sum invested at 4% per annum compounded semi-annually amounts to Rs.1,20,000 at the end of one year. Find the sum

(a) 1,15,340 (b) 1,10,120

(c) 1,12,812 (d) 1,13,113

90. Solving equation $3g^2 - 14g + 16 = 0$, we get roots as

(a) ± 5 (b) 0

(c) 8 and 2/3 (d) 2 and 8/3

91. Find the future value of annuity of Rs.1,000 made annually for 7 years at interest rate of 14% compounded annually. Given that $1.14^7 = 2.5023$

(a) 10,730.7 (b) 5,365.35

(c) 8,756 (d) 9,892.34

92. Find the present value of Rs.1,00,000 to be required after 5 years if the interest rate be 9%. Given that $1.09^5 = 1.5386$

(a) 78,995.98 (b) 64,994.20

(c) 88,992.43 (d) 93,902.12

93. A five year annuity due has periodic cash flow of Rs.100 each year. If the interest rate is 8% the future value of this annuity is given by

(a) (Rs.100) x (future value at rate 8% for 5 years) x (0.08)

(b) (Rs.100) x (future value at rate 8% for 5 years) x (1 - .08)

(c) (Rs.100) x (future value at rate 8% for 5 years) x (1 + .08)

(d) (Rs.100) x (future value at rate 8% for 5 years) x (1/0.08)

94. A person decides to invest Rs.1,25,000 per year for the next five years in an annuity which gives 5% per annum compounded annually. What is the approx. future value? (use $1.05^5 = 1.2762$, if needed)

(a) 1,59,535 (b) 6,90,704

(c) 5,90,704 (d) 3,59,535

95. Find the compound interest if an amount of Rs.50,000is deposited in a bank for one year at the rate of 8% per annum compounded semi annually

(a) Rs.3080 (b) Rs.4080

(c) Rs.5456 (d) Rs.7856

96. Which of the following statements is TRUE? (assume that the yearly cash flows are identical for both annuities)

(a) The present value of an annuity due is greater than the present value of an ordinary annuity.

(b) The present value of an ordinary annuity is greater than the present value of an annuity due.

(c) The future value of an ordinary annuity is greater than the future value of an annuity due.

(d) The future value of an annuity due is equal to future value of an ordinary annuity.

97. Rs.2,500 is paid every year for 10 years to pay off a loan. What is the loan amount if interest rate be 14% per annum compounded annually?

(a) 15,847.90 (b) 13,040.27

(c) 14,674.21 (d) 16,345.11

98. Suppose you deposit Rs.900 per month into an account that pays 4.8% interest, compounded monthly. How much money (rounded to nearest rupee) will you get after 9 months? (use if needed $1.0004^4 = 1.0008$)

(a) Rs.9,000 (b) Rs.8,113

(c) Rs.9,200 (d) Rs.1,000

99. An amount is lent at a nominal rate of 4.5% per annum compounded quarterly. What would be the gain in rupees over when compounded annually?

(a) 0.56 (b) 0.45

(c) 0.76 (d) 0.85

100. A stock pays annually an amount of Rs.10 from 6^{th} year onwards. What is the present value of the perpetuity, if the rate of return is 20%?

(a) 20.1 (b) 19.1

(c) 21.1 (d) 22.1

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JAN 2021

ICAI CA FOUNDATION EXAM PAPER
BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS
(JANUARY 2021)

1. The salaries of A, B and C are in the ratio 2 : 3 : 5. If increments of 15%, 10% and 20% are allowed respectively to their salaries, then what will be the new ratio of their salaries?
   (a) 3 : 3 : 10 (b) 10 : 11: 20
   (c) 23 : 33 : 60 (d) Cannot be determined

2. The ratio of two quantities is 15 : 17. If the consequent of its inverse ratio is 15, then the antecedent is.
   (a) 15 (b) $\sqrt{15}$
   (c) 17 (d) 14

3. In a certain business, A and B received Profit in a certain ratio; B and C received profits in the same ratio. If A gets Rs. 1,600 and C gets Rs. 2,500, then how much does B get?
   (a) Rs. 2,000 (b) Rs. 2,500
   (c) Rs. 1,000 (d) Rs. 1,500

4. Find the value of $\frac{3t^{-1}}{t^{-1/3}}$
   (a) $\frac{3}{t^{2/3}}$
   (b) $\frac{3}{t^{3/2}}$
   (c) $\frac{3}{t^{1/3}}$
   (d) $\frac{3}{t^{2}}$

5. **If $\log_a (ab) = x$, then $\log_b (ab)$ is –**
   (a) 1/x (b) $\frac{x}{1+x}$
   (c) $\frac{x}{x-1}$ (d) None of these

6. A business house wishes to simultaneously elevate two of its six branch heads. In howmany ways these elevations can take place?
(a) 12 (b) 3
(c) 6 (d) 15

7. ${}^{n}C_{p} + 2{}^{n}C_{p-1} + {}^{n}C_{p-2}$?
(a) ${}^{n}C_{p}$ (b) ${}^{n+2}C_{p}$
(c) ${}^{n+1}C_{p+1}$ (d) ${}^{n+2}C_{p-1}$

8. There are ten flights operating between city A and city B. The number of ways inwhich a person can travel from city A to city B and return by different flight, is
(a) 90 (b) 95
(c) 80 (d) 78

9. 'n' locks and 'n' corresponding keys are available but the actual combination is not known. The maximum number of trails that are needed to assigns the keys to the corresponding locks is.
(a) $(n - 1)C_2$ (b) $(n + 1)C^2$
(c) $\sum_{k=2}^{n} (k-1)$ (d) $\sum_{k=2}^{n} K$

10. How many different ways, can the letters of the word 'DETAIL' be arranged in such a way that the vowels occupy only the odd numbered position?
(a) 32 (b) 36
(c) 48 (d) 60

11. How many odd numbers of four digits can be formed with digits 0, 1, 2, 3, 4, 7 and 8 ?
(a) 150 (b) 300
(c) 120 (d) 210

12. Eight chairs are numbered form 1 to 8. Two women and three men are to be seated by allowing one chair for each. First, the women choose the chairs from the chairs numbered 1 to 4 and then men select the chairs from the remaining. The number of possible arrangements is.
(a) 120 (b) 288
(c) 32 (d) 1440

13. The number of integers from 1 to 100 which are neither divisible by 3, nor by 5 norby 7, is
(a) 67 (b) 55
(c) 45 (d) 33

14. In a geometric progression, the 3rd and 6th terms are, respectively, 1 and –1/8. The first term (a) and common ratio are respectively.
(a) 4 and ½ (b) 4 and –1/4
(c) 4 and –½ (d) 4 and 1/4

15. The nth term of the series 3 + 7 + 13 + 21 + 31 + ... is
(a) 4 n –1 (b) $n^2 + 2n$
(c) $n^2 + n + 1$ (d) $n^2 + 2$

16. The set of cubes of natural numbers is

(a) Null set (b) A finite set
(c) An infinite set (d) Singleton set

17. $\int_1^2 e^x\left(\frac{1}{x}-\frac{1}{x^2}\right)ds =$

(a) $e\left(\frac{e}{2}-1\right)$ **(b)** e(e – 1)
(c) a **(d)** e^2 (e–i)

18. For the set of observations {(1, 2), (2, 5), (3, 7), (4, 8), (5, 10)}, the value of Karlperson's coefficient of correlation is approximately given by
(a) 0.755 (b) 0.655
(c) 0.525 (d) 0.985

19. The coefficient of correlation between x and y is 0.5, the covariance is 16, and the standard deviation of x is 4. Then the standard deviation of y is
(a) 4 (b) 8
(c) 16 (d) 64

20. The intersecting point of the two regression lines: y or x and on y is.
(a) (0, 0) (b) $(\bar{x}, \bar{y})$
(c) (b_{xy}, b_{yx}) (d) (1, 1)

21. Given that the variance of x is equal to the square of standard deviation of y and the regression line of y on x is y = 40 + 0.5 (x - 30). Then regression line of x on y is
(a) y = 40 + 4 (x - 30) (b) x = 40 + .5 (y - 30)
(c) y = 40 + 2 (x - 30) (d) x = 30 + 2 (y - 40)

22. The regression coefficients remain unchanged due to
(a) A shift of scale (b) A sift of origin
(c) Replacing x - values by 1/x (d) Replacing values by 1/y

23. **The cost function of production is given by** $C(x)=\frac{x^3}{2}-15x^2+36x$ **where x denotes the number of items produced. The level of output for which marginal cost is minimum and the level of output for which the average cost is minimum are given by, respectively**

(a) 10 and 15 (b) 10 and 12
(c) 12 and 15 (d) 15 and 10

24. Find the coefficient of mean deviation about mean for the data :
5, 7, 8, 10, 11, 13, 19
(a) 17.28
(b) 28.57
(c) 32.11
(d) 18.56

25. Which of the following is a relative measure of dispersion?
(a) Range
(b) Mean deviation
(c) Standard deviation
(d) Coefficient of quartile deviation

26. It is given that the mean (X) is 10 and standard deviation (s.d.) is 3.2. If the observations are increased by 4, then the new mean and standard deviations are:
(a) $\overline{X}$ = 10, s.d. = 7.2
(b) $\overline{X}$ = 10, s.d. = 3.2
(c) $\overline{X}$ = 14, s.d. = 3.2
(d) $\overline{X}$ = 14, s.d. = 7.2

27. The relationship between P-series and Q series is given by 2P - 3Q - 10. If the range P- Series is 18. What would be the range of Q?
(a) 10
(b) 15
(c) 9
(d) 12

28. The best statistical measure used for comparing two series is
(a) Mean absolute deviation
(b) Range
(c) Coefficient of variation
(d) Standard deviation

29. **Let f. R $\Rightarrow$ R be defined by**

$$f(x)\begin{cases} 2x & \text{for} \quad x > 3 \\ x^2 & \text{for} \quad 1 < x \le 3 \\ 3x & \text{for} \quad x \le 1 \end{cases}$$

The value of f(–1)+ f(2) + f(4) is
(a) 9 (b) 14
(c) 5 (d) 6

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. Find the amount of compound interest, if an amount of Rs. 50,000 is deposited in a bank for one year at the rate of 8% per annum compounded semiannually
(a) 3080
(b) 4080
(c) 5456
(d) 7856

32. The population of a town increase by 2% of the population at the beginning of the year. The number of year by which the total increases in population would be 40% is:
(a) 7 years
(b) 10 years
(c) 17 years
(d) 19 years (approx)

33. Find the future value of annuity of Rs. 1,000 made annually for 7 year at interest rate of 14% compounded annually (Given that $1.14^7 = 2.5023$)
(a) Rs. 10,730.7
(b) Rs. 5,365.35
(c) Rs. 8,756
(d) Rs. 9,892.34

34. Two equal amounts of money an deposited in two banks each at 15% p.a. fix 3.5 year in the bank and fix 5 years in the either. The difference between the interest amount from the bank in Rs. 144. Find the sum
(a) Rs. 620
(b) Rs. 640
(c) Rs. 820
(d) Rs. 840

35. The simple on sum at 4% p.a. for 2 years is Rs. 80. Find the CI on the came sum for the same period.
(a) Rs. 81.6
(b) Rs. 80.8
(c) Rs. 83.2
(d) Rs. 82.3

36. Which is a better investment 9% p.a. compounded quarterly or 9.1% p.a. simple interest?
(a) 9% compounded
(b) 9.1% S.T.
(c) Both are same
(d) Cannot be said

37. The effective rate of interest corresponding to a nominal rate of 7% p.a. compounded quarterly is
(a) 7.5%
(b) 7.6%
(c) 7.7%
(d) 7.18%

38. Assuming that the discount rate is 7% p.a. how much would pay to receive Rs. 200 growing at 5% annually for ever?
(a) Rs. 2,500
(b) Rs. 5,000
(c) Rs. 7,500
(d) Rs. 10,000

39. A man invested one-third of his capital at 7% one fourth at 8% and the remainder at 10%. If the annual income is Rs. 561. The capital is-
(a) Rs. 4,400
(b) Rs. 5,500
(c) Rs. 6,600
(d) Rs. 5,800

40. A sum of money is lent at C.I. Rate 20% p.a. 2 years. It would fetch Rs. 482 more if the interest is compounded half yearly. The sum is:
(a) Rs. 19,800
(b) Rs. 19,900
(c) Rs. 20,000
(d) Rs. 20,100

41. Rs. 800 is invested at the end of each month in an account paying interest 6% per year compounded monthly. What is the future value of this annually after 10th payment?
(a) Rs. 4,444
(b) Rs. 8,756
(c) Rs. 3,491
(d) Rs. 8,176

42. What 'i' denote the actual rate of interest in decimal, and n denote the number of conversion periods, the formula for computing the effective rate of interest E is given by.
(a) $(1 + i)^n$
(b) $(1 + i)^n - 1$
(c) $1 - (1 + i)^n$
(d) $(1 + i)^{-n}$

43. The present value of an Annuity immediate is the same as
(a) Annuity regular for (n -1) year plus the initial receipt in the beginning of the period
(b) Annuity regular for (n -1) years
(c) Annuity regular for (n + 1) years
(d) Annuity regular for (n + 1) years plus the initial receipt in the beginning of the period

44. From the records on sizes of shoes sold in a shop, one can compute the following to determine the most preferred shoe size.
(a) Mean
(b) Median
(c) Mode
(d) Range

45. Which of the following measure does not possess mathematical properties?
(a) Arithmetic mean
(b) Geometric mean
(c) Harmonic mean
(d) Median

46. If y = 3 + (4.5)x and the mode for x-value is 20, then the mode for y–is
(a) 3.225 (b) 12
(c) 24.5 (d) 93

47. 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) $\frac{n_1H_1+n_2H_2}{n_1+n_2}$ (b) $\frac{n_1H_1+n_2H_2}{H_1+H_2}$
(c) $\frac{n_1+n_2}{n_1H_1+n_2H_2}$ (d) $\frac{(n_1+n_2)H_1H_2}{n_1H_2+n_2H_1}$

48. **If an unbiased coin is tossed twice, then the probability of obtaining at least one tall is.**
(a) 1 (b) 0.5
(c) 0.75 (d) 0.25

49. **Two dice are thrown simultaneously. The probability of a total score of 5 from the outcomes of dice is**
(a) 1/18 (b) 1/12
(c) 1/9 (d) 2/25

50. **A basket contains 15 white bawls, 25 red balls and 10 blue balls. If a ball is selected at random, the probability of selecting a coloured ball is**
(a) 0.20 (b) 0.25
(c) 0.60 **(d) 0.70**

51. **Three identical and balanced dice are rolled. The probability that the same number will appear on each of them is**
(a) 1/6 (b) 1/18
(c) 1/36 (d) 1/24

52. **An event that can be subdivided into further events is called as**
(a) A Composite event (b) A complex event
(c) A mixed event (d) A simple event

53. A bar chart is drawn for
(a) Continuous date
(b) Nominal data
(c) Time series data
(d) Comparing different components

54. A tabular presentation can be used for
(a) Continuous series data (b) Nominal data
(c) Time series data for longer period (d) Primary data

55. A variable qualitative characteristic is known as
(a) Quality variable (b) An attribute
(c) A discrete variable (d) A continuous variable

56. The accuracy and consistency of data can be verified by
(a) Scrutiny (b) Internal Checking
(c) External Checking (d) Double Checking

57. From a histogram one cannot compute the approximate value of
(a) Mode (b) Standard deviation
(c) Median (d) Mean

58. The left part of a table providing the description of rows is called
(a) Caption (b) Box – head
(c) Stub (d) Body

59. Mode can be obtained from _____ .
(a) Frequency polygon (b) Histogram
(c) Ogive (d) All of the above

60. Most of the commonly used distributions provide a
(a) Bell-shaped (b) U-shaped
(c) J – shaped curve (d) Mixed Curve

61. Which of the following is suitable for the graphical representation of a cumulative frequency distribution?
(a) Frequency polygon (b) Histogram
(c) Ogive (d) Pic Chart

62. Sweetness of sweet dish is
(a) An Attribute (b) A discrete Variable
(c) A Continuous Variable (d) A Variable

63. **A coin with probability for head as 1/5 is tossed 100 times. The standard deviation of the number of heads turned up is.**
(a) 3 (b) 2
(c) 4 (d) 6

64. **If an unbiased coin is tossed three times, what is the probability of getting more than one head?**
(a) ½ (b) 3/8
(c) 7/8 (d) 1/3

65. **Which one of the following is an uniparametric distribution?**

(a) Poisson (b) Normal
(c) Binomial (d) Hyper geometric

66. **For a normal distribution, the value of third moment about mean is**

(a) 0 (b) 1
(c) 2 (d) 3

67. **If X is a Poission variable, and P (X = 1) = P(X=2), then P(x = 4) is**

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

68. **The cost of living index is always**
(a) Price index number (b) Quantity index number
(c) Weighted index number (d) Value index number

69. **Fisher's index number does not satisfy**
(a) Unit test (b) Circular test
(c) Time reversal test (d) Factor reversal test

70. **When the prices for quantities consumed of all commodities are changing in the same ratio. Then the index numbers due to Laspeyre's and passsche's will be**
(a) Equal
(b) Unequal
(c) Reciprocal of Marshall Edge worth Index number
(d) Reciprocal of Fisher Index number

71. $\frac{1}{2}, \frac{3}{4}, \frac{5}{8}, \frac{7}{16} = ?$
(a) 9/32
(b) 10/17
(c) 11/34
(d) 12/35

72. Find the missing term
P 3 C, R 5 F, T 8 I, V 12 L, _____?
(a) Y170
(b) X17M
(c) X170
(d) X160

73. Find out the odd man out in the Sequence 8, 27, 64, 125, 216.
(a) 27
(b) 64
(c) 125
(d) 216

74. In a certain Code Language BEAT is written as YVZG, then what will be code for MILD?
(a) ONRW
(b) NOWR
(c) ONWR
(d) NROW

75. In a certain code RIPPLE is written as 613382, and LIFE is written as 8192. How will RIFFLE be written in that code?
(a) 618892
(b) 689912
(c) 619982
(d) 629981

76. A man is facing west. He turns 45° in the clockwise direction and then another 180° in the same direction and then 270° in the anti-clockwise direction. Which is the facing now?
(a) South-West
(b) North-West
(c) West
(d) South

77. One day Ram left home and bi-Cycled 10 km southwards, turned right and travelled 5km and turned right and went 10km he turned left and went 10km how many kilometers he has to cycle to reach his home straight?
(a) 10
(b) 15
(c) 20
(d) 25

78. Ms. N walks 19km towards North from there she walks 6km towards South. Then she walks 3km towards East. How far and in which direction is she with reference to her starting point?

(a) 4 km West
(b) 6 km West
(c) 3 km East
(d) 3 km North/East

79. A, B, C and D are playing cards, A and B are partners. D faces towards North. If a faces West, then who faces south?

(a) C
(b) B
(c) D
(d) Data is inadequate

80. A is seated between D and F at a round table. C is seated opposite to D. E is round adjust to D. Who sit opposite to B?

(a) A
(b) D
(c) C
(d) F

81. Four Indian, A, B, C and D and four Chinese E, F, G and H are sitting in a circle around a table facing the each other in a conference. No two Indians or Chinese are sitting side by side, C who is sitting between G and E is being D, F is between D and A and facing G, H is to the left of B. Who is sitting left of A?

(a) E
(b) F
(c) G
(d) H

82. Five friends A, B, C, D and E are sitting on a bench. A is sitting nest to B; C is sitting next to D, D is not sitting with E; E is at the left and of bench. C is on second position from the right; A is on the right side of B who is the right side of E. A and C are sitting together. What is the position of B?

(a) Second from right
(b) Centre
(c) Extreme left
(d) Second from left

83. P is the brother of Q and R, S is the mother of R. T is the father of P, Which of the following statement cannot be definitely true?

(a) S is the mother of P
(b) P is son of S
(c) T is husband of S
(d) Q is son of T

84. Pointing to a a lady in a photograph, Ram said "Her son's father is the son in law of my mother". How is Ram related to the lady?

(a) Aunt
(b) Cousin
(c) Sister
(d) Mother

85. A girl introduced, a boy as the son of the daughter of father of her uncle. The boy is girl's

(a) Son
(b) Brother
(c) Son-in-Law
(d) Uncle

86. Pointing to a lady, Sahil said, "She is the daughter of the woman who is the mother of the husband of my mother". Who is the lady to Sahil?

(a) Aunt
(b) Sister
(c) Daughter
(d) Sister-in-Law

87. **Statements:**

All men are cups.

All cups are plates

Conclusions:

I. All men are plates
II. All cups are buckets

(a) If only conclusion I follows
(b) If only conclusion II follows
(c) If either conclusions I or II follows
(d) If neither conclusions

88. **Statements:**
Lawyers marked only fair girls.
Shoba is very fair
Conclusions:
I. Shoba was married for lawyer
II. Shoba was not married lawyer
(a) If only I follows
(b) If only II follows
(c) If either I or II follows
(d) If neither I nor II follows

89. **Statements:**
Sohan a good sportsman
Sportsman are healthy
Conclusions:
I. All healthy persons are sportsman
II. Sohan is healthy
(a) If only I follows
(b) If only II follows
(c) If either I or II follows
(d) If neither i nor II follows

90. **Statements:**
No man is a tiger
Raj is a man
Conclusion:
I. Raj is a tiger
II. All man are not Raj
(a) If only I follows
(b) If only II follows
(c) If either I or II follows
(d) If neither I nor II follows

91. The value of P/or which the difference between the root of equation $x^2 + px + 8 = 0$ is 2
(a) ± 2
(b) ± 4
(c) ± 6
(d) ± 8

92. If the quadratic equation $x^2 + px + q = 0$ and $x^2 = qx + p = 0$ have a common root hen $p + q = ?$

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

93. If $A + B = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ and $A - 2B = \begin{bmatrix} -1 & 1 \\ 0 & -1 \end{bmatrix}$

Then A =

(a) $\begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}$

(b) $\begin{bmatrix} 2/3 & 1/3 \\ 1/3 & 2/3 \end{bmatrix}$

(c) $\begin{bmatrix} 1/3 & 1/3 \\ 2/3 & 1/3 \end{bmatrix}$

(d) $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$

94. The matrix $A = \begin{vmatrix} 1 & -2 & 3 \\ 1 & -3 & 4 \\ 1 & 1 & 2 \end{vmatrix}$ is:

(a) Symmetric
(b) Skew-Symmetric
(c) Singular
(d) Non-Singular

95. The harmonic mean of the roots of the equation

$(5 + \sqrt{2})x^2 - (4 + \sqrt{5})x + 8 + 2\sqrt{5} = 0$ *is*

(a) 2
(b) 4
(c) 6
(d) 8

96. The common region in the graph of the inequalities $x + y \leq 4$, $x - y \leq 4$, $x \geq 2$ is
(a) Equilateral triangle
(b) Isosceles triangle
(c) Quadrilateral
(d) Square

97. In the set of all straight lines on a plane which of the following is Not 'TRUE'?
(a) Parallel to an equivalence relation
(b) Perpendicular to is a symmetric relation
(c) Perpendicular to is an equivalence relation
(d) Parallel to a reflexive relation

98. In a time series on yearly production, there will be no_____variations.
(a) Trend
(b) Seasonal
(c) Cyclical
(d) Irregular

99. For the time series data given below semi-average method is used to find trend values:

Year	2011	2012	2013	2014	2015	2016
Y:	80	120	140	100	150	160

What is the trend value for the year 2015?
(a) 150
(b) 130
(c) 110
(d) 120

100. The fire in a factory is an example of:
(a) Secular trend
(b) Seasonal movements
(c) Cyclical trend
(d) Irregular variations

ANSWER KEY

1	C	2	C	3	A	4	A	5	C	6	D	7	B	8	A	9	D	10	B
11	B	12	A	13	C	14	C	15	C	16	C	17	A	18	D	19	B	20	B
21	D	22	B	23	A	24	C	25	D	26	C	27	D	28	C	29	A	30	D
31	B	32	C	33	A	34	B	35	A	36	A	37	D	38	D	39	C	40	C
41	D	42	B	43	A	44	C	45	D	46	B	47	D	48	C	49	C	50	D
51	C	52	A	53	D	54	B	55	B	56	A	57	B	58	C	59	B	60	A
61	C	62	A	63	C	64	A	65	A	66	A	67	A	68	C	69	B	70	A
71	A	72	C	73	A	74	D	75	C	76	A	77	B	78	D	79	A	80	A
81	A	82	D	83	D	84	C	85	B	86	A	87	A	88	D	89	B	90	D
91	C	92	B	93	C	94	C	95	B	96	B	97	B	98	B	99	B	100	D

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JULY 2021

BUSINESS MATHEMATICS AND LOGICAL REASONING & STATISTICS (JULY 2021)

1) If xy+yz+zx = -1, then the value of $\left(\frac{x+y}{1+xy}+\frac{z+y}{1+zy}+\frac{x+z}{1+zx}\right)$ is

a) xyz
b) $\frac{-1}{yz}$
c) $\frac{1}{xyz}$
d) $\frac{1}{x+y+z}$

2) If $\log_4 x + \log_{16} x + \log_{64} x + \log_{256} x = 25/6$ then the value of x is
a) 64
b) 4
c) 16
d) 2

3) Let U be the universal set, A and B are the subsets of U. If n(U) = 650, n(A) = 310, n(A∩B) = 95 and n(B) = 190, then $n(\overline{A} \cap \overline{B})$ is equal to ($\overline{A}$ and $\overline{B}$ are the complement of A and B, respectively)
a) 400
b) 200
c) 300
d) 245

4) The range of the function f defined by $f(x) = \sqrt{16 - x^2}$ is
a) [-4, 0]
b) [-4, 4]
c) [0, 4]
d) (-4, 4)

5) Let A = R - {3} and B = R - {1}. Let f A → B defined by $f(x) = \frac{x-2}{x-3}$. What is the value of $f^{-1}\left(\frac{1}{2}\right)$?

a) 2/3
b) 3/4
c) 1
d) -1

6) If $f(x) = x^2 - 1$ and $g(x) = |2x + 3|$, then $f_o g(3) - g_o f(-3)$ =
a) 71
b) 61
c) 41
d) 51

7) The number of terms of the series: 5 + 7 + 9 + ... must be taken so that the sum may be 480
a) 20

b) 10
c) 15
d) 25

8) If the sum of 'n' terms of an AP (Arithmetic Progression) is $2n^2$, the fifth term is_____
a) 20
b) 50
c) 18
d) 25

9) The sum of three numbers in a geometric progression is 28. When 7,2 and 1 are subtracted from the first, second and the third numbers respectively, then the resulting numbers are in arithmetic progression. What is the sum of squares of the original three numbers?
a) 510
b) 456
c) 400
d) 336

10) If α and β are the roots of the equation $2x^2 + 5x + k = 0$, and $4(\alpha^2 + \beta^2 + \alpha\beta) = 23$, then which of the following is true?
a) $k^2 + 3k - 2 = 0$
b) $k^2 - 2k + 3 = 0$
c) $k^2 - 2k - 3 = 0$
d) $k^2 - 3k + 2 = 0$

11) The cost of 2 oranges and 3 apples is Rs. 28. If the cost of an apple is doubled then the cost of 3 oranges and 5 apples is Rs. 75. The original cost of 7 oranges and 4 apples (in Rs.) is
a) 59
b) 47
c) 71
d) 63

12) The value of `K' is_____, if 2 is a root of the following cubic equation: $x^3 - (k + 1)x + k = 0$
a) 2
b) 6
c) 1
d) 4

13) The sum of square of any real positive quantities and its reciprocal is never less than
a) 1
b) 2
c) 3
d) 4

14) If $A = \begin{bmatrix} 1 & 0 \\ -1 & 1 \end{bmatrix}$ then the value of A^5 is
a) $\begin{bmatrix} 1 & 0 \\ -1 & 5 \end{bmatrix}$

b) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

c) $\begin{bmatrix} 1 & 0 \\ -5 & 1 \end{bmatrix}$

d) $\begin{bmatrix} 1 & -5 \\ 0 & 1 \end{bmatrix}$

15) If $y = 4 + 9 \sin 5x$ then which holds good?
a) $-5 \leq y \leq 13$
b) $-4 \leq y \leq 8$
c) $0 < y < 1$
d) $-5 < y < 5$

16) If ${}^{n}p_6 = 20\ {}^{n}p_4$ then the value of n is given by
a) n = 5
b) n = 3
c) n = 9
d) n = 8

17) How many numbers of seven digit numbers which can be formed from the digits 3,4,5,6,7,8,9 no digits being repeated are not divisible by 5?
a) 4320
b) 4690
c) 3900
d) 3890

18) A person can go from place 'A' to 'B' by 11 different modes of transport but is allowed to return back to "A" by any mode other than the one earlier. The number of different ways, the entire journey can be complete is_____
a) 110
b) 10^{10}
c) 9^5
d) 10^9

19) The number of ways 5 boys and 5 girls can be seated at a round table, so no two boys are adjacent is
a) 2550
b) 2880
c) 625
d) 2476

20) A sum of 7500 amounts to Rs. 9075 at 10% p.a., interest being compounded yearly in a certain time. The simple interest (in Rs.) on the same sum for the same time and the same rate is
a) 1000
b) 1250
c) 1800
d) 1500

21) A loan of 1,02,000 is to be paid back in two equal annual instalments. If the rate of interest is 4% p.a., compounded annually, then the total interest charged (in Rs.) under this instalment plan is
a) 6160
b) 8120
c) 5980
d) 7560

22) If the desired future value after 5 years with 18% interest rate is Rs. 1,50,000, then the present value (in Rs.) is (Given that $(1.18)^5 = 2.2877$)
a) 63,712
b) 65,568
c) 53,712
d) 41,712

23) What is the compound interest (in Rs.) on a sum of 12,600 for $1^{1/2}$ years at 20% per annum if the interest is compounded half yearly? (Nearest to a Rupee)
a) 4271
b) 4171
c) 4711
d) 4117

24) A sum of x amounts to 27,900 in 3 years and to 41,850 in 6 years at a certain rate percent per annum, when the interest is compounded yearly. The valueof x is
a) 16080
b) 18600
c) 18060
d) 16800

25) If the nominal rate of growth is 17% and inflation is 9% for the five years. Let P be the Gross Domestic Product (GDP) amount at the present year then the projected real GDP after 6 years is
a) 1.587 P
b) 1.921 P
c) 1.403 P
d) 2.51 P

26) If a person bought a house by paying 45,00,000 down payment and Rs. 80,000 at the end of each year till the perpetuity, assuming the rate of interest as 16%, the present value of house (in Rs.) is given as
a) 47,00,000

b) 45,00,000
c) 57,80,000
d) 50,00,000

27) Let the operating profit of a manufacturer for five years is given as:

Year	1	2	3	4	5	6
Operating profit (in Iakh Rs.)	90	100	106.4	107.14	120.24	157.35

Then the operating profit of Compound Annual Growth Rate (CAGR) for year 6 with respect to year 2 is given at
a) 9%
b) 12%
c) 11%
d) 13%

28) If discount rate is 14% per annum, then how much a company has to pay to receive 280 growing at 9% annually forever.
a) 5,600
b) 2,800
c) 1,400
d) 4,200

29) The effective rate of return for 24% per annum convertible monthly is given as
a) 24%
b) 26.82%
c) 18%
d) 24.24%

30) If the cost of capital be 12% per annum, then the net present value (in nearest Rs.) from the given cash flow is given as

Year	0	1	2	3
Operating profit (in thousands Rs.)	(100)	60	40	50

a) 31048
b) 34185
c) 51048
d) 24187
Note: Correct Ans is Rs. 21,048/- by taking the nearest value option D is preferable

31) A certain sum amounts to Rs. 15748 in 3 years at simple interest at r% p.a. The same sum amounts to Rs. 16,510 at (r+2)% p.a. simple interest in the same time What is the value of r?
a) 10%
b) 8%
c) 12%
d) 6%

32) What is the difference (in Rs.) between the simple interest and the compound interest on a sum of 8,000 for $2^{2/5}$ years at the rate of 10% p.a., when the interest is compounded yearly?
a) 135.75
b) 129.50
c) 151.75
d) 147.20

33) The future value of annuity of Rs. 2,000 for 5 years at 5% compounded annually is given (in nearest Rs.) as
a) 51051
b) 21021
c) 15624
d) 61254
NOTE: Correct Ans is Rs. 11,051/- by taking the nearest value option C is preferable

34) In a market there are 30 shops to allocate to people. If they allocate x shops then their monthly expenses, in rupees, is given by, $P(x) = -8x^2 + 400x - 1000$, then the number of shops should they allocate to minimize the expenses.
a) 0
b) 30
c) 25
d) 10

35) The cost function $C(x) = 125 + 500x - x^2 + x^3/3$, $0 \leq x \leq 100$ and the demand function for the items is given by, $p(x) = 1500 - x$, then the marginal profit when 18 items are sold is
a) 751
b) 571
c) 676
d) 875

36) If $f(x) = 3e^{x^4}$ then $f'(x) - 4x^3 f(x) + \left(\frac{1}{3}\right) f(0) - f'(0)$ is equal to
a) 0
b) e^{x^4}
c) 1
d) -1

37) The value of $\int_{-2}^{2} f(x)\,dx$, where $f(x) = 1+x$, $x \leq 0$; $f(x) = 1-2x$, $x \geq 0$ is
a) 20
b) -2
c) -4
d) 0

38) The salaries of A,B and C are of ratio 2:3:5. If the increments of 15%, 10% and 20% are done to their respective salaries, then find the new ratio of the salaries.
a) 23:33:60
b) 33:23:60
c) 23:60:33
d) 33:60:23

39) A vessel contained a solution of acid and water in which water was 64%. Four litres of the solution were taken out of the vessel and the same quantity of water was added. If the resulting solution contains 30% acid, the quantity(in litres) of the solution, in the beginning in the vessel, was
a) 12
b) 36
c) 24
d) 27

40) If A : B = 5 : 3. B : C = 6 : 7 and C : D / 14 : 9, then the value of A:B:C:D

a) 20 : 14 : 12 : 9
b) 20 : 9 : 12 : 14
c) 20 : 9 : 14 : 12
d) 20 : 12 : 14 : 9

41) Choose the missing term in the series .....1,1,8,4.27, _____ 64,16
a) 27
b) 11
c) 9
d) 125

42) The wrong term in the series ..... 225,196,169,144,121,100,77,64, is_____
a) 121
b) 77
c) 100
d) 169

43) If DELHI is coded as EFMIJ then JAIPUR is coded as_____
a) JQVSBK
b) QVSKBJ
c) BJQVSK
d) KBJQVS

44) If FRAME is coded as 0618011305 then ARISE is coded as_____
a) 0118091905
b) 0119091805
c) 0118190905
d) 0118091805

45) If CLOCK is coded as 34235 and TIME as 8679, then MOTEL is coded as
a) 27894
b) 72964
c) 72894
d) 77684

46) A and B start moving towards each other from two places 200 m apart. After walking 60 m, B turns left and goes 20 m, then he turns right and goes 40 m. He then turns right again and comes back to the road on which he had started walking. If A and B walk with the same speed, what is the distance between them now?
a) 80 m
b) 70 m
c) 40 m
d) 60 m

47) There are four towns P,Q,R and T. Q is to the south-west of P, R is to the east of Q and southeast of P, and T is to the north of R in line with QP. In which direction of P is T located?
a) North
b) North-East
c) East
d) South-East

48) Five friends A,B,C,D and E are staying in the same locality. B's house is to the east of A's house and to the north of C's house. C's house is to the west of D's house. D's house 0 is in which direction with respect to A's house?
a) North-East

b) South-East
c) North-West
d) South-West

49) One morning, after sunrise, Vikram and Shailesh were standing in a lawn with their backs 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

50) Pointing towards "A", "B", said : "Your mother is the younger sister of my mother". "A" is related to "B" as
a) Uncle
b) Cousin
c) Nephew
d) Father

51) Shyam's mother said to Shyam "my mother has a son whose son is Ram". Shyam is related to Ram as_____.
a) Uncle
b) Cousin
c) Nephew
d) Grandfather

52) Amit said "This girl is the wife of the grandson of my mother". How Amit related to the girl?
a) Father-in-law
b) Grandson
c) Father
d) Son

53) A is the son of C; C and Q are sisters; Z is the mother of Q and P is the son of Z. Which of the following statements is true?
a) A and P are cousins
b) C and P are sisters
c) P is the maternal uncle of A
d) A is the maternal uncle of P

54) A,B,C,D and E are sitting on a bench. A is sitting next to B. C is sitting next to D, D is not sitting with E who is on the left end of the bench. C is on the second position from the right. A is to the right of B and E. A and C are sitting together. In which position A is sitting between?
a) C and D
b) D and E
c) B and C
d) B and D

55) Five girls are sitting on a bench to be photographed. Seema is to the left of Rani and to the right of Bindu. Mary is to the right of Rani. Reeta is between Rani and Mary. Who is sitting immediate right to Reeta?
a) Seema
b) Rani
c) Bindu
d) Mary

56) Six friends P,Q,R,S,T and U are sitting around the hexagonal table each at one corner and are facing the centre of the hexagonal. P is second to the left of U. Q is neighbor of R and S. T is second to the left of S. Which one is sitting opposite to S?
a) R
b) P
c) Q
d) T

57) 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 only
b) G,B and C
c) E,F and A
d) G and B only

58) Statement: All fruits are lions. All lions are foxes. Some foxes are beggars.
Conclusion -
i. All fruits are foxes.
ii. Some fruits are beggars
a) Only I follows
b) Only II follows
c) None follows
d) Both I and II follows

59) Statement: All flowers are toys. Some toys are idiots. Some angles are idiots.
Conclusion -
i. Some angles are toys.
ii. Some idiots are flowers.
iii. Some flowers are angles
a) Only I follows
b) Only II follows
c) Only III follows
d) None follows

60) Statement: Some buttons are rivers. Some rivers are shirts. All shirts are people.
Conclusion -
i. Some people are rivers.
ii. Some people are buttons
iii. Some shirts are buttons.
a) Only I follows
b) Only II follows
c) Only III follows
d) Both II and III follows

61) Expenditures of a Company (in Million Rupees) per item in various Years

Year	Item of Expenditures				
	Salary	Fuel and Transport	Bonus Interest	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88

2002	420	142	3.96	49.4	98

What is the average amount of interest per year which the company had to pay during this period?

a) 33.66
b) 36.66
c) 31.66
d) 39.66

62) There are n numbers. When 50 is subtracted from each of these number the sum of the numbers so obtained is -10. When 46 is subtracted from each of the original n numbers, then the sum of numbers, so obtained is 70. What is the mean of the original n numbers?

a) 56.8
b) 25.7
c) 49.5
d) 53.8

The mean of 'n' observation is 'X'. If K is added to each observation, then the new mean is _____

e) X
f) XK
g) X - K
h) X + K

63) If y = 3 + 1.9 x, and mode of x is 15, then the mode of y is

a) 15.9
b) 27.8
c) 35.7
d) 31.5

64) The mean deviation of the numbers 3,10,6,11,14,17,9,8,12 about the mean is (correct to one decimal place)

a) 8.7
b) 4.2
c) 3.1
d) 9.8

65) The standard deviation of 1 to 9 natural numbers is_____

a) 6.65
b) 2.58
c) 6.75
d) 5.62

66) The probable value of mean deviation when Q3 = 40 and Q1 = 15 is_____

a) 15
b) 18.75
c) 17.50
d) 0

67) If the numbers are 5,1,8,7,2, then the coefficient of variation is

a) 56.13%
b) 59.13%
c) 48.13%
d) 44.13%

68) If every observation is increased by 7 then

a) Standard Deviation increases by 7

b) Mean deviation increases by 7
c) Not affected at all
d) Quartile Deviation increases by 7

69) If a school has 14 teachers, their heights (in cm) are: 172,173,164,178,168,169,173,172,173,164,178,168,169,173, then average deviation of this data is
a) 2.43 approx.
b) 3.93 approx.
c) 3.43 approx.
d) 2.92 approx.

70) If the relationship between x and y is given by 2x + 3y = 10 and the range of y is 10, then what is the range of x?
a) 10
b) 18
c) 8
d) 15

71) If the sum of the product of the deviation and Y from their means is zero, the correlation coefficient between X
a) Zero
b) Positive
c) Negative
d) 10

72) 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

73) If Y = 9X and X = 0.01Y, then r is equal to:
a) -0.1
b) 0.1
c) 0.3
d) -0.3

74) The straight - line graph of the linear equation Y = a + b X, slope is horizontal if:
a) b = 1
b) b ≠ 0
c) b = 0
d) a = b ≠ 0

75) If b_{yx} = -1.6 and b_{xy} = -0.4, then r_{xy} will be
a) 0.4
b) -0.8
c) 0.64
d) 0.8

76) The consumer price Index goes up from 120 to 180 when salary goes up from 240 to 540, what is the increase in real terms?
a) 80
b) 150
c) 120
d) 240

77) The weighted aggregative price index numbers for 2001 with 2000 as the base year using Paashe's Index Number is

Commodity	Price (in Rs.)		Quantities	
	2000	2001	2000	2001
A	10	12	20	22
B	8	8	16	18
C	5	6	10	11
D	4	4	7	8

a) 112.32
b) 112.38
c) 112.26
d) 112.20

78) The weighted aggregative price index numbers for 2001 with 2000 as the base year using Marshal - Edgeworth Index Number is

Commodity	Price (in Rs.)		Quantities	
	2000	2001	2000	2001
A	10	12	20	22
B	8	8	16	18
C	5	6	10	11
D	4	4	7	8

a) 112.26
b) 112.20
c) 112.32
d) 112.38

79) The weighted aggregative price index numbers for 2001 with 2000 as the base year using Fisher's Index Number is

Commodity	Price (in Rs.)		Quantities	
	2000	2001	2000	2001
A	10	12	20	22
B	8	8	16	18
C	5	6	10	11
D	4	4	7	8

a) 112.32
b) 112.20
c) 112.38
d) 112.26

80) If in an additive model 0 refers to original data as 875, T refers to trend 700, S refers to seasonal variations -200, C refers to cyclical variations 75 then the value of I which refers to irregular variations is
a) -100
b) -170
c) -140
d) -150

81) There were 200 employees in an office in which 150 were married. Total male employees were 160 out of which 120 were married. What was the number of female unmarried employees?
a) 30
b) 40
c) 50
d) 10

82) Data collected on religion from the census reports are
a) Primary data
b) Unclassified data
c) Sample data
d) Secondary data

83) Which of the following diagram is the most appropriate to represents various heads in total cost?
a) Pie chart
b) Bar graph
c) Multiple line chart
d) Scatter plot

84) In a graphical representation of data, the largest numerical value is 4 the smallest numerical value is 25. If classes desired are 4 then which class interval is
a) 45
b) 5
c) 20
d) 7.5

85) In graphical representation of data, ideographs are also called as
a) Picto-graphs
b) Asymmetry graphs
c) Symmetry graphs
d) Pictograms

86) _____means separating items according to similar characteristics grouping them into various classes.
a) Classification
b) Editing
c) Separation
d) Tabulation

87) Frequency density of a class interval is the ratio of_____
a) Class frequency to the total frequency
b) Class length to class frequency
c) Class frequency to the cumulative frequency
d) Frequency of that class interval to the corresponding class length

88) A graph that uses vertical bars to represent data is called a
a) Line graph
b) Scatter plot
c) Vertical graphs
d) Bar graph

89) A biased coin is such that the probability of getting a head is thrice the probability of getting a tail. If the coin is tossed 4 times, what is the probability of getting a head all the times?
a) 2/5
b) 81/128
c) 81/256
d) 81/64

90) If there are 16 phones, 10 of them are Android and 6 of them are of Apple, then the probability of 4 randomly selected phones to include 2 Android and 2 Apple phone is

a) 0.47
b) 0.51
c) 0.37
d) 0.27

91) If there are 48 marbles marked with numbers 1 to 48, then the probability of selecting a marble having the number divisible by 4 is
a) 1/2
b) 2/3
c) 1/3
d) 1/4

92) If in a class, 60% of the student study Mathematics and Science and 90% of the student study Science, then the probability of a student studying Mathematics given that he / she is already studying Science is
a) 1/4
b) 2/3
c) 1
d) 1/2

93) A bag contains 7 Blue and 5 Green balls. One ball is drawn at random. The probability of getting a Blue ball is_____
a) 5/12
b) 12/35
c) 7/12
d) 0

94) The probability that a football team loosing a match at Kolkata is 3/5 and winning a match at Bengaluru is 6/7, the probability of the team winning at least one match is_____
a) 3/35
b) 18/35
c) 32/35
d) 17/35

95) The value of K for the probability density function of a variate X is equal to

X	0	1	2	3	4	5	6
P (X)	5K	3K	4K	6K	7K	9K	11K

a) 39
b) 1/40
c) 1/49
d) 1/45

96) In normal distribution, Mean, Median and Mode are
a) Zero
b) Not Equal
c) Equal
d) Null

97) It is a Poisson variate such that P(x = 1) = 0.7, P(x = 2) = 0.3, then P(x = 0) =
a) $e^{6/7}$
b) $e^{-6/7}$
c) $e^{-2/3}$
d) $e^{-1/3}$

98) If X is a binomial variate with p = 1/3, for the experiment of 90 trials, then the standard deviation is equal to

a) $-\sqrt{5}$

b) $\sqrt{5}$

c) $2\sqrt{5}$

d) $\sqrt{15}$

99) For a certain type of mobiles, the length of time between charges of the battery is normally distributed with a mean of 50 hours and a standard deviation of 15 hours. A person owns one of these mobiles and wants to know the probability that the length of time will be between 50 and 70 hours is (Given ϕ)(1.33) = 0.9082, ϕ(0) = 0.5)

a) -0.4082
b) 0.5
c) 0.4082
d) -0.5

ANSWER KEY

1.	C	**2.**	C	**3.**	D	**4.**	C	**5.**	C	**6.**	D	**7.**	A
8.	C	**9.**	D	**10.**	D	**11.**	A	**12.**	B	**13.**	B	**14.**	C
15.	A	**16.**	C	**17.**	A	**18.**	A	**19.**	B	**20.**	D	**21.**	A
22.	B	**23.**	B	**24.**	B	**25.**	A	**26.**	D	**27.**	B	**28.**	A
29.	B	**30.**	21048	**31.**	B	**32.**	D	**33.**	11051.26	**34.**	C	**35.**	C
36.	C	**37.**	B	**38.**	A	**39.**	C	**40.**	D	**41.**	C	**42.**	B
43.	D	**44.**	A	**45.**	C	**46.**	C	**47.**	B	**48.**	B	**49.**	C
50.	B	**51.**	B	**52.**	A	**53.**	C	**54.**	C	**55.**	D	**56.**	B
57.	C	**58.**	A	**59.**	D	**60.**	A	**61.**	B	**62.**	49.37	**63.**	D
64.	D	**65**	C	**66.**	2.61	**67.**	A	**68.**	B	**69.**	C	**70.**	C
71.	D	**72.**	A	**73.**	B	**74.**	C	**75.**	C	**76.**	B	**77.**	125
78.	D	**79.**						**82.**	D		D		
85.	B	**86.**	D	**87.**	A	**88.**	D	**89.**	D	**90.**	C	**91.**	0.37
92.	C	**93.**	B	**94.**	C	**95.**	C	**96.**	C	**97.**	C	**98.**	B
99.	C	**100.**	C										

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JUNE 2022

ICAI CA Foundation Business Mathematics and Logical Reasoning & Statistics Exam Paper with Solution June 2022

1. Find the value of z from $\left(\sqrt{9}\right)^{-8} \times \left(\sqrt{3}\right)^{-5} = 3^{z}$

(a) $\frac{2}{21}$

(b) $\frac{-21}{2}$

(c) $\frac{21}{2}$

(d) $\frac{-2}{21}$

2. Find the value of $\frac{3t^{-1}}{t^{\frac{-1}{3}}}$

(a) $\frac{3}{t^{\frac{2}{3}}}$

(b) $\frac{3}{t^{\frac{3}{2}}}$

(c) $\frac{3}{t^{\frac{1}{3}}}$

(d) $\frac{3}{t^{2}}$

(3) If $\log_{a}\sqrt{3} = \frac{1}{6}$, find the value of a.

(a) 9
(b) 81
(c) 27
(d) 3

(4) $\log \frac{p^2}{qr} + \log \frac{q^2}{pr} + \log \frac{r^2}{pq} =$ _____

(a) pqr

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

(c) 1
(d) 0

(5) Two finite sets have m and n elements. The total number of subsets of the first set is 56 more than the total number of subsets of the second set. The values of m and n are

(a) 6, 3
(b) 7, 6
(c) 5, 1
(d) 8, 7

(6) If $f(p) = \frac{1}{1-p'}$ then f^1 is

(a) 1 - p

(b) $\frac{p-1}{p}$

(c) $\frac{p}{p-1}$

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

(7) Let R = {(3, 3) (6, 6), (9, 9) ,(12, 12) (6, 12), (3, 9), (3, 12), (3, 6)} be a relation on the set A = {3, 6, 9, 12}. Then relation is

(a) an equivalence relation
(b) reflexive and transitive only
(c) reflexive only
(d) reflexive and symmetric only

(8) If the nth term of the arithmetic progression 9, 7, 5 ... is same as the nth term of the arithmetic progression 15, 12, 9 ..., then n will be

(a) 7
(b) 9
(c) 15
(d) 11

(9) In a geometric progression, the second term is 12 and the sixth term is 192. Find the 11th term.

(a) 3,072
(b) 1,536
(c) 12,288
(d) 6,144

(10) The first and last terms of an arithmetic progression are 5 and 905. Sum of the terms is 45,955. The number of terms is

(a) 99
(b) 100
(c) 101
(d) 102

(11) The sum of first eight terms of geometric progression is five times the sum of the first four terms. The common ratio is

(a) $\sqrt{2}$
(b) $\sqrt{3}$
(c) 4
(d) 2

(12) If one root of $5z^2 + 13z + y = 0$ be reciprocal of the other then the value of y is

(a) $\frac{1}{5}$
(b) $\frac{-1}{5}$
(c) 5
(d) -5

(13) Solve the following pair of Linear equations for x and y: $\left(\frac{b}{a}\right)x + \left(\frac{a}{b}\right)y = a^2 + b^2$

(a) $x = \frac{a}{b},\ y = \frac{b}{a}$
(b) x = 3ab, y = -ab
(c) x = -ab, y = 3ab
(d) x = ab, y = ab

(14) A man wants to cut three lengths from a single piece of board of length 91 cm. The second length is to be 3 cm longer than the shortest and third length is to be twice as the shortest. What is the possible length for the shortest piece?
(a) 22
(b) 20
(c) 15
(d) 18

(15) Which of the following is the differentiation of $e^t.\log_e t$ with respect to 't'?
(a) $e^t(t\ \log_e t)$
(b) $\frac{e^t(1+t\ \log_e t)}{t}$
(c) $\frac{e^t}{t}$
(d) $e^t(1-\log_e t)$

(16) If x:y = 4: 6 and 2: x = 1: 2 the y =_____
(a) 4
(b) 6
(c) $\frac{1}{3}$
(d) $\frac{3}{2}$

(17) A bag contains 25 paise, 10 paise and 5 paise coins in the ratio 3:2:1. The total value is Rs. 40, the number of 5 paise coins is
(a) 45
(b) 48
(c) 40
(d) 20

(18) Six points are marked on a straight line and five points are marked on another line which is parallel to the first line, how many straight lines, includin the first two, can be formed with these points?
(a) 28
(b) 30
(c) 32
(d) 34

(19) How many 4 letter words with or without meaning, can be formed out of the letters of the word, 'LOGARITHMS', if repetition of letters is not allowed?
(a) 7,020
(b) 5,040
(c) 1,480
(d) 2,520

(20) There are 10 flights operating between City-A to City-B. the number of ways in which a person can travel from City-A to City-B and return by a different flight is
(a) 90
(b) 95
(c) 80
(d) 78

(21) Out of 7 boys and 4 girls, a team of a debate club of 5 is to be chosen. The number of teams such that each team includes at least one girl is
(a) 4439
(b) 429
(c) 419
(d) 441

(22) The total number of sitting arrangements of 8 members of a board on a row with the president and the vice-president occupying central places is
(a) 7! x 2!
(b) 6! x 2!
(c) 6!
(d) 7!

(23) The solution for $\frac{n!}{10} = (n-1)_{pn-3}$ then n =
(a) 5
(b) 6
(c) 7
(d) 8

(24) A multiple - choice test contains five questions and each has four possible options. How many different answer keys are possible?
(a) 20
(b) 120
(c) 256
(d) 1024

(25) Find the future value of annuity of Rs. 1,000 made annually for 7 years at interest rate 14% compounded annually. Given that $(1.14)^7$=2.5023
(a) Rs. 10,730.71
(b) Rs. 5,365.35
(c) Rs. 8,756
(d) Rs. 9,892.34

(26) Assuming that the discount rate is 7% p.a. How much would you pay to receive Rs. 200. Growing at 5% annually forever?
(a) Rs. 2,500
(b) Rs. 5,000
(c) Rs. 7,500
(d) Rs. 10,000

(27) Rs. 2,500 is paid every year for 10 years to pay off a loan. What is the loan amount if interest rate be 14% p.a. compounded annually?
(a) Rs. 15,847.90
(b) Rs. 13,040.27
(c) Rs. 14,674.21
(d) Rs. 16,345.11

28. Rs. 800 is invested 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 $1.005^{10}=1.0511$
(a) Rs. 4,444
(b) Rs. 8,766
(c) Rs. 3,491
(d) Rs. 8,176

29. Lokesh deposits Rs. 3,000 at the start of each quarter in his savings account. If the account earns interest 5.75% per annum compounded quarterly, how much money (in Rs.) will he have at the end of 4 years? ($1.014375^{16}=1.25696$)
(a) Rs. 53,624.4
(b) Rs. 58,353.6
(c) Rs. 68,353.6
(d) Rs. 63,624.4
Note: According to the given MCQ the correct answer is Rs. 54,397.31. So choose nearest value that is option 'a'.

30. Raj made an investment of Rs. 15,000 in a scheme and at the time of maturity the amount was Rs. 25,000. If compound Annual Growth Rate (CAGR) for this investment is 8.88%. calculate the approximate number of years for which he has invested the amount.
(a) 6
(b) 7.7
(c) 5.5
(d) 7

31. Madhu takes a loan of Rs. 50,000 from XYZ Bank. The rate of interest is 10% pr annum. The first installment will be paid at the end of year 5. Determine the amount (in Rs.) of equal installments, if Madhu wishes to repay the amount in five installments.
(a) Rs. 19,510
(b) Rs. 19,430
(c) Rs. 19,310
(d) Rs. 19,630

32. Ramesh invests Rs. 20,000 per year in a stock index fund, which earns 9% per year, for the next ten years. What would be the closets value of the accumulated value of the investment upon payment of the last installment? (1.09^{10} = 2.36736)
(a) Rs. 3,88,764.968
(b) Rs. 3,03,858.594
(c) Rs. 2,68,728.484
(d) Rs. 4,08,718.364

33. An investment is earning compound interest, Rs. 100 invested in the year 2 accumulated to Rs. 105 by year 4. If Rs. 500 invested in the year 5, will become Rs._____by year 10.
(a) 364.80
(b) 564.80
(c) 464.80
(d) 664.80

34. An investor is saving to pay off an obligation of Rs. 15,250 which will be due in seven years, if the investor is earning 7.5% simple interest rate per annum, he must deposit Rs._____to meet the obligation.
(a) 8,000
(b) 9,000
(c) 10,000
(d) 11,000

35. There is 60% increase in an amount in 6 years at simple interest. What will be the compound interest of Rs. 12,000 after 3 years at the same rate?
(a) Rs. 3,972
(b) Rs. 2,160
(c) Rs. 3,120
(d) Rs. 3,742

36. The present value of Rs. 2,000, after 8 years at the rate of 6% per annum, is_____. ($1.06^8 = 1.59385$)
(a) Rs. 1,054
(b) Rs. 1,254
(c) Rs. 3,054
(d) Rs. 2,054

37. The annual rate of simple interest is 12.5%, in how many years does the principal double?
(a) 11 years
(b) 9 years
(c) 8 years
(d) 7 years

38. A company creates a sinking fund of Rs. 2,00,000 in a bank account for 15 years bank offers interest rate 6% per annum the yearly payment to be paid by company is approximately ↔ (if need, use: $1.06^{14} = 2.209$)
(a) Rs. 8,945
(b) Rs. 8,145
(c) Rs. 9,345
(d) Rs. 9,645

39. $\int_0^1 xe^x\,dx$
(a) -1
(b) 1
(c) e^1
(d) e^{-1}

40. Determine f (x), given that $f^{l}(x) = 12x^2 - 4x$ and f (-3) = 17.
(a) $f(x) = 4x^3 - 2x^2 + 143$
(b) $f(x) = 6x^2 - x^4 + 137$
(c) $f(x) = 3x^4 - x^3 - 137$
(d) $f(x) = 4x^3 - 2x^2 - 143$

41. A labour can be paid under two methods as given below:
(i) Rs. 600 fixed and Rs. 50 per hr.
(ii) Rs. 170 per hr.

If a particular job work takes 'r' hours to complete, find out the value of r for which the method (ii) gives the labour gets the better wages.
(a) x = 6
(b) x = 4
(c) x = 3
(d) x = 2

42. 9,27,31,155,161,1127, ?- Find missing number?
(a) 1316
(b) 1135
(c) 1288
(d) 2254

43. What is the missing number in the sequence given below?
12, 9, 13, 50, 30, 375, ?, 341, 71875
(a) 91.125
(b) 89.145
(c) 90.475
(d) 92.485

44. 7, 26, 63, 124, 215, 342 ?- Find the missing number.
(a) 391
(b) 421
(c) 481
(d) 511

45. In a certain code 'TELEPHONE' is written as ENOHPELET. Then ALIGATOR is written as
(a) ROTAGILA
(b) ROTAGAIL
(c) ROTAGILE
(d) TOTAGILA

46. In a coded language, if 'EARTH' is written as 34215 and 'VENUS' is written as 73089. What is the code for "SATURN"?
(a) 941012
(b) 941820
(c) 914281
(d) 912418

47. If P x 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?
(a) North-west
(b) South-east
(c) North-east
(d) South-east

48. I am facing west, turning to the left I go 20 m, then turning to the left I go 20 m and turning to the right I go 20m, then again turning to the right I go 40 m and then again I go 40 m to the right. In which direction am I from my original position?
(a) North
(b) west
(c) South
(d) East

49. A, B, C, D, E, F, G, H, and I are nine poles. C is 2 km east of B. A is 1 km north of Band H is 2 km south of A.G is 1 km west of H while D is 3 km East of G and F is 2 km north of G. I is situated right in the middle of B and C while E is just in the middle of H and I. The Distance between B and I is
(a) 1 km
(b) 1.41 km
(c) 2 km
(d) 3 km

50. Starting from a point, Rani walked 12 m South, she turned left and walked 10 m, she again turned left and walked 12 m, then she turned right and walked 5 m. how far is she now and in which direction from the starting point?
(a) 27 m towards East
(b) 5 m towards East
(c) 10 m towards West
(d) 15 m towards East

51. Puru was driving his car and at a circle there was direction pole, which was showing all the four correct directions. But due to the wind, it turns in such a manner that now North pointer is showing West. Puru went in the wrong direction thinking that he was travelling East. In what direction he was actually travelling?
(a) West
(b) East
(c) North
(d) South

52. A woman going with a boy is asked by another woman about the relationship between them. The woman replied "My maternal uncle and the uncle of his maternal uncle is the same". How is the lady related with that boy?
(a) Grand mother and grandson
(b) Mother and Son
(c) Brother and sister
(d) Aunt and Nephew

53. If X+ Y means Xis the mother of Y; X- y means X is the brother y; X % Y means X is the father of Y and X x Y means X is the sister of y, Which of the following shows that A is the maternal uncle of B?
(a) B + D x C -A
(b) B - D % A
(c) A - C + D x B
(d) A + C x D - B

54. B and C are siblings. M has two children, and he is son of E, who is father-in-law of H. H has only one son. C is not granddaughter of E. How's B related to E?
(a) Daughter
(b) Son
(c) Granddaughter
(d) Grandson

55. Ravi is a son of Aman's father's sister. Sahil is the son of Divya who is the mother of Gaurav and grandmother of Aman. Ashok is the father of Tanya and grandfather of Ravi Divya is the wife of Ashok.
How is Ravi related to Divya?
(a) Nephew
(b) Son
(c) Grandson
(d) Father

56. Rani told Jaya, "The girl I met yesterday at the beach was the youngest daughter of the brother-in-law of my friend's mother." How is the girl related to Rani's friend?
(a) Cousin
(b) Daughter
(c) Mother
(d) Aunt

57. Six friends Surya, Bhanu, Dinkar, Ravi, Suraj and Dinesh Are sitting in a circle and are facing the centre of the circle, Dinesh is between Dinkar and Suraj. Bhanu is between Ravi and Surya. Dinkar and Ravi are opposite to each other. Who are the immediate neighbours of Ravi?
(a) Suraj and Dinesh
(b) Dinkar and Bhanu
(c) Surya and Dinesh
(d) Bhanu and Suraj

58. Eight persons E, F, G, H, I, J, K and L are seated around a square table, facing table - two on each side. J is between L and F; G is between I and F; H a lady member is second to the left of J; F a male member is seated opposite to E, a lady member There is a lady member between F and I. who among the following is to the immediate left of F?
(a) G
(b) I
(c) J
(d) H

59. Five persons are sitting on a bench to be photographed, S is to the left of N and to the right of B. M is to the right of N. R is between N and M. Who is sitting immediate right to R?
(a) B
(b) N
(c) M
(d) S

60. Six friends P, Q, R, S, T and U are sitting around the hexagonal table each at one corner and are facing the center of the hexagonal. P is second to the left of U. Q is neighbour of R and S. T is second to the left of S.
Which one is sitting opposite to P?
(a) R
(b) Q
(c) T
(d) S

61. _____Mean is calculated, when the values in series do not have equal importance.
(a) Arithmetic
(b) Harmonic
(c) Geometric
(d) Weighted

62. The coefficient of deviation based on 25^{th} and 75^{th} percentiles of 6, 9, 3, 8, 4, 5, 8 and 4 is
(a) 50
(b) 100/3
(c) 30
(d) 25

63. Which one of the following is not a measure of central tendency?
(a) Median
(b) Range
(c) Arithmetic Mean
(d) Harmonic Mean

64. A seller of pearls kept the pearls in seven boxes labelled from one to seven. At the end of a day, he found that J labelled box contained J pearls, the average number of pearls per box is
(a) 4
(b) 6.5
(c) 7.5
(d) 8

65. The Mean of 100 students was 45. Later on, it was discovered that the marks of two students were misread as 85 and 54 instead of 58 and 45. Find out the correct mean.
(a) 68
(b) 36
(c) 44.64
(d) 52

66. Calculate the value of 3^{rd} quartile from the following data 40, 35, 51, 30, 21, 25, 16, 29, 27, 32.
(a) 36.25
(b) 30.25
(c) 25
(d) 35

67. What is mean deviation about mean of the following numbers?
11, 8, 10, 10, 12, 9
(a) 2
(b) 1
(c) 1.5
(d) 1.8

68. Following are the ages of 8 employees of a small old age home expressed in 96, 50, 67, 75, 71, 69, 64, 66. Find the range and its coefficient.
(a) 46, 31.51 respectively
(b) 51, 37.67 respectively
(c) 43, 29.49 respectively
(d) 49, 36.42 respectively

69. Find the standard deviation and coefficient of variation of 1, 6, 5, 9, 8.
(a) 2.78 and 40.83 respectively
(b) 2.45 and 47.93 respectively
(c) 2.78 and 47.93 respectively
(d) 2.87 and 49.37 respectively

70. The arithmetic mean and coefficient of variation of data set X are respectively, 10 and 30. The variance of 30 - 2X is
(a) 28
(b) 32
(c) 34
(d) 36

71. Which measure of dispersion is base on the absolute deviation only?
(a) Range
(b) Standard deviation
(c) Mean deviation
(d) Quartile deviation

72. If the plotted points in a scatter diagram lie from lower left to upper right, then the correlation is
(a) Negative
(b) Perfect Negative
(c) Zero
(d) Positive

73. For finding correlation between two qualitative characteristics, we use
(a) Coefficient of rank correlation
(b) Scatter diagram
(c) Coefficient of concurrent deviation
(d) Product moment correlation coefficient

74. Karl Pearson's coefficient is defined from
(a) Grouped data
(b) Ungrouped data
(c) Any data
(d) Scattered data

75. For n pairs of observations, the coefficient of concurrent deviation is calculated as $\frac{1}{\sqrt{5}}$ If there are six concurrent deviations, then n =
(a) 11
(b) 10
(c) 9
(d) 8

76. For positive and perfectly correlated random variables, one of the regression coefficient is 1.3 and the standard deviation of X is 2, the variance of Y is
(a) 2.66
(b) 6.76
(c) 6.56
(d) 3.16

77. The test of shifting the base is called
(a) Unit
(b) Circular
(c) Time reversal
(d) Factor reversal

78. 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) $\frac{p_1 - p_0}{p_1}$

79. Laspeyre's 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 the base year
(d) Value of items consumed in the current year

80. Which one of the following method is based on geometric mean for calculating index number?
(a) Fishers' method
(b) Kelley's method
(c) Paasche's method
(d) Laspeyre's method

81. Which one of the following test is not applied for selecting an appropriate index number?
(a) Time reversal
(b) Price Relative
(c) Factor Reversal
(d) Circular

82. Sweetness of a sweet dish is
(a) An attribute
(b) A discrete variable
(c) A continuous variable
(d) a variable

83. Median of a distribution can be obtained from
(a) Frequency polygon
(b) Histogram
(c) Less than type ogives
(d) Pie-chart

84. We get_____by plotting cumulative frequency against the respective class boundary.
(a) Histogram
(b) Polygon
(c) Pie chart
(d) Ogives

85. Types of research data are
(a) Organised data and unorganized data
(b) Qualitative data and quantitative data
(c) Processed data and unprocessed data
(d) Discrete data and continuous data

86. The collected information on which of the following characteristic do not form data?
(a) The number of files audited are 'less than 6'. 'between 5 and 10' and more than 9'
(b) The number of files audited are 'very less'. 'moderate' and very large'
(c) The number of files audits in a file
(d) The number of auditors who audited a file

87. Histograms are drawn only when
(a) Frequencies in various class intervals are equal
(b) Class intervals are equal
(c) Class intervals are unequal
(d) for less than type cumulative frequencies

88. Which one of the following is not a mode of presentation of data?
(a) Textual presentation
(b) Tabular presentation
(c) External presentation
(d) Diagrammatic representation

89. Which one of the following is a continuous variable?
(a) The quantum of days to get a cure from illness
(b) The quantum of oxygen cylinders used to treat a patient
(c) The quantum of drug injected in to a patient
(d) The quantum of tablets prescribe to a patient

90. If P (A) = 0.3, P (B) = 0.8 and P (B/A) = 0.5.
Find P (A ∪ B).
(a) 0.7
(b) 0.95
(c) 0.60
(d) 0.59

91. What is the chance that a leap year selected at random will contain 53 Fridays?
(a) 3/7
(b) 1/7
(c) 2/7
(d) 4/7

92. Two balanced dice are rolled. The probability of getting 1 in at lest one dice is x/36 where x is
(a) 12
(b) 1
(c) 11
(d) 2

93. Thirty balls are serially numbered and placed in a bag. Find chance that the first ball drawn is a multiple of 3 or 5.
(a) 8/15
(b) 2/15
(c) 1/2
(d) 7/15

94. The odds in favour of an event A is 2 : 3 and odds against an event Bis 6: 4 the probability that only one of A and B occurs is y/25 where yis
(a) 12
(b) 15
(c) 18
(d) 9
Note: In the given MCQ "if they are independent" is missing.

95. The odds in favour of event A, in a trial, is 3:1. In a three independent trials, the probability of no occurrence of the event A is
(a) 1/64
(b) 1/32
(c) 1/27
(d) 1/8

96. The binomial distribution, having mean and standard deviation as 3 and 1.5, has number of trials equal to
(a) 3
(b) 6
(c) 8
(d) 12

97. The mean of binomial distribution is
(a) always less than its variance
(b) always more than its variance
(c) always equal to its variance
(d) always equal to its standard deviation

98. The variance of a normal distribution is given to be 16. The mean deviation about mode is
(a) 3.2
(b) 8
(c) 12.8
(d) 12

99. The standard deviation of a Poisson variate X is 1.732. The P [-2.9 < X < 3.54] is
(a) $13e^{-3}$
(b) $9e^{-3}$
(c) $4e^{-2}$
(d) e^{-6}

100. For a normal distribution, the first and third quartiles are given to be 37 and 49, the mode of the distribution is
(a) 37
(b) 49
(c) 43
(d) 45

ANSWER SHEET

1	2	3	4	5	6	7	8	9	10
B	A	C	D	A	B	B	A	D	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	C	D	A	B	B	C	C	B	A
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
D	B	A	D	A	D	B	D	A	A
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
C	B	B	C	A	B	C	A	B	A
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
A	B	A	D	A	B	B	B	A	D
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
C	B	C	C	C	A	D	C	C	D
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
D	B	B	A	C	A	B	A	C	D
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
C	D	A	B	A	A	B	A	A	A
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
B	A	C	C	B	B	B	C	A	B
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
C	C	D	A	A	D	B	A	A	C

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DEC 2022

MATHS QUESTIONS
CA FOUNDATION PAPER DECEMBER 2022

1. A sum of money is to be distributed among A, B, C, D in the proportion of 5 : 2 : 4 : 3. If C gets ₹1,000 more than D, what is B's share?
   (a) 2,000 (b) 1500
   (c) 2500 (d) 1000

2. A group of 400 soldiers posted at border area had a provision for 31 days. After 28 days 280 from this group were called back. Find the number of days for which the remaining rations will be sufficient?
   (a) 3 (b) 6
   (c) 8 **(d) 10**

3. By simplifying $(2a^3 b^4)^6 /(4a^3b)^2 \times(a^2b^2)$, the answer will be
   (a) $4a^2 b^3$ (b) $4a^6 b$
   (c) $4a^{10}b^{10}$ **(d) $4a^{10}b^{20}$**

4. If $\log_{10} 2 = y$ and $\log_{10} 3 = x$, then the value of $\log_{10} 15$ is:
   (a) x – y + 1 (b) x + y + 1
   (c) x –y – 1 (d) y – x + 1

5. $\log_3 4. \log_4 5 \log_5 6. \log_6 7 \log_7 8. \log_8 9$ equal to
   (a) 3 **(b) 2**
   (c) 1 (d) 0

6. The solution of the following system of linear equation 2x – 5y + 4 = 0 and 2x + y – 8 = 0 will be
   (a) (2, –3) (b) (1,–4)
   (c) (3,2) (d) (–2,2)

7. If the cost of 3 bags and 4 pens is ₹267 where as the cost of 4 bags and 3 pens is ₹324, then the cost of one bag is:
   (a) 8 (b) 24
   (c) 32 **(d) 75**

8. What will be the value of k, if the roots of the equation $(k–4)x^2–2k\,x + (k+5)=0$ are equal
   (a) 18 **(b) 20**
   (c) 19 (d) 21

9. If the roots of the equation $x^2 – px + q = 0$ are in the ratio 2 : 3 then
   (a) $p^2= 25q$ (b) $P^2 = Gq$
   (c) $6p^3= 5q$ **(d) $6p^2= 25q$**

10. If 2x +5 > 3x + 2 and 2x – 3< = 4x – 5, the 'x' can take which of the following value?
    (a) 4 (b) –4
    (c) 2 (d) –2

11. **A farmer borrowed ₹ 3600 at the rate of 15% simple interest per Annum. At the end of 4 years, he cleared this account by paying ₹ 4000 and a cow. The cost of the cow is:**
(a) ₹1000 (b) ₹1200
(c) ₹1550 **(d) ₹1760**

12. **If ₹64 Amount to ₹ 83.20 in 2 years, what will ₹ 86 Amount to in 4 years at the same Rate percent per annum?**
(a) ₹ 127.60 (b) ₹147.60
(c) ₹145.34 (d) ₹117.60

13. **The effective annual rate of interest corresponding to a normal rate of 6% per annum payable half yearly is:**
(a) 6.06% (b) 6.07%
(c) 6.08% **(d) 6.09%**

14. **Mr. Prakash invested money in two schemes 'A' and 'B' offering compound interest at the rate of 8% and 9% per annum respectively. It the total amount of interest accrued through these two schemes together in two years was ₹4818.30 and total amount invested was ₹27,000. What was the amount invested in schemes 'A'?**
(a) ₹ 12,000 (b) ₹12,500
(c) ₹ 13,000 (d) ₹13,500

15. **A sum of money invested of compound interest double itself in four years. In how many years it become 32 times of itself at the same rate of compound interest.**
(a) 12 Years (b) 16 Years
(c) 20 Years (d) 24 Years

16. **A sum of money double itself in 4 years at certain compound interest rate. In how many years this sum will become 8 times at the same compound interest rate ?**
(a) 12 Years (b) 14Years
(c) 16 Years (d) 18 Years

17. **The difference between compound interest and simple interest on an amount of ₹15,000 for 2 years is ₹96. What is the rate of interest per Annam?**
(a) 9% **(b) 8%**
(c) 11% (d) 10%

18. **A machine worth ₹4,90,740 is depreciated at 15% on its opening value each year. When it value would reduce to ₹ 2,00,750**
(a) 5 year 5 months (b) 5 year 6 months
(c) 5 years 7 months (d) 5 year 8 months

19. **How much amount is required to be invested every year so as to accumulate ₹5,00,000 at the end of 12 years if interest is compounded annually at 10% {Where A (12,0.1) = 3.1384284}**
(a) ₹23381.65 (b) ₹24385.85
(c) ₹26381.65 (d) ₹28362.75

20. **Raju invests ₹20,000 every year in a deposit scheme starting from today for next 12 years. Assuming that interest rate on this deposit is 7% per annum compounded annually.**
What will be the future value of this annuity? Given that $(1+0.07)^{12}= 2.25219150$
(a) ₹540,576 **(b) ₹382,813**
(c) ₹643,483 (d) ₹357,769

21. **Mr. A invested ₹ 10,000 every year for next 3 years at the interest rate of 8 percent per annum compounded annually. What is future value of the annuity?**
(a) 32644 **(b) 32464**
(c) 34264 (d) 36442

22. **₹5,000 is invested every month and in an account paying interest @ 12% per annum compounded monthly. What is the future value of this annuity just after making 11th payment" (Given that $(1.01)^{11}= 1.1156$)**
(a) ₹57,800 (b) ₹56100
(c) ₹56,800 (d) ₹57,100

23. **Sinking fund factor is the reciprocal of :**
(a) Present value interest factor of a single cash flow
(b) Present value interest factor of an annuity
(c) Future value interest factor of an annuity
(d) Future value interest factor of a single cash flow.

24. **10 years ago the earning per share (EPS) of ABC Ltd. was ₹ 5 share Its EPS for this year is ₹22. Compute at what rate, EPS of the company grow annually?**
(a) 15.97% (b) 16.77%
(c) 18.64% (d) 14.79%

25. **The number of ways 4 boys and 3 girls can be seated in a row so that they are alternates:**
(a) 12 (b) 288
(c) 144 (d) 256

26. **How many 3 digit odd numbers can be formed using the digits 5,6,7,8,9, if the digits can be repeated?**
(a) 55 **(b) 75**
(c) 65 (d) 86

27. **If $^{n}p_{r}= 3024$ and $^{n}c_{r} = 126$, then find n and r**
(a) 9,4 (b) 10,3
(c) 12,4 (d) 11,4

28. **There are 20 points in a plane area. How many triangles can be formed by these points if 5 points are collinear?**
(a) 550 (b) 560
(c) 1130 (d) 1140

29. **If pth term of an AP is q and its qth term is p, then what will be the value of (p+q)th term?**
(a) 0 (b) 1
(c) p +q –1 (d) 2 (p+q –1)

30. If Arithmetic Mean and Geometric Mean between two number are 5 and 4 respectively, then these numbers are

(a) 2 & 3 **(b) 2 & 8**
(c) 4 & 6 (d) 1 & 16

31. In a GP 5th term is 27 and 8th term is 729. Find its 11th term.

(a) 729 (b) 6061
(c) 2187 **(d) 19683**

32. If A = {1,2,3,4,5,7,8,9} and B = {2,4,6,7,9} then how many proper subset of A∩B can be created

(a) 16 **(b) 15**
(c) 32 (d) 31

33. The number of a subjects of the subset (0, 1, 2, 3) is

(a) 2 (b) 4
(c) 8 **(d) 16**

34. Let A = (1,2,3) and consider the relation R = {(1,1), (2,2), (3,3), (1,2), (2,3), (1,3)}. Then R is

(a) Symmetric and transitive
(b) Reflexive but not transitive
(c) Reflexive but not symmetric
(d) Neither symmetric, nor transitive

35. If $y = x^x$, then dy/dx at x = 1 is equal to

(a) 0 **(b) 1**
(c) −1 (d) 2

36. If $x^5 + y^5 - 5xy = 0$ then $\frac{dy}{dx}$ is

(a) $\frac{y+x^4}{x+y^1}$ **(b)** $\frac{y-x^4}{y^4-x}$
(c) $\frac{x-y^4}{x^1-y}$ (d) $\frac{x+y^4}{x^4+y}$

37. The maxima and minima of the function $y = 2x^3 - 15x^2 + 36x + 10$ occurs respectively at

(a) x = 2 and x = 3 (b) x = 1 and x = 3
(c) x = 3 and x = 2 (d) x = 3 and x = 1

38. $\int_2^4 \frac{x\,dx}{x^2+1}$ is

(a) $A = \frac{1}{2}\log\left(\frac{17}{5}\right)$ (b) $2\log\left(\frac{17}{5}\right)$
(c) $\frac{1}{2}\log\left(\frac{5}{17}\right)$ (d) $2\log\left(\frac{5}{17}\right)$

39. $\int (2x-3)^5 dx$ is

(a) $\frac{(2x-3)^6}{6}$ (b) $\frac{(2x-3)^6}{2}$
(c) $\frac{(2x-3)^6}{12}$ (d) $\frac{(2x-3)^6}{3}$

40. **Find the area under curve $f(x) = x^2 + 5x + 2$ with the limits 0 to 1**

(a) 3.833 (b) 4.388
(c) 4.833 (d) 3.338

41. **If 'FROZEN' is decoded as 'OFAPSG'. Tick the right option that depicts 'MOLTEN' written in this way?**

(a) OFPOMN (b) OFSMPN
(c) OFUMPN (d) OFUNPN

42. **In certain code language, if TOUR, is written as 1234, CLEAR is written 5678 and SPARE is written as 90847, Find the code for CARE?**

(a) 1247 (b) 4847
(c) 5247 **(d) 5847**

43. **If ROSE 'is coded as 6821, CHAIR is coded as 73456 and PREACH is coded as 961473, what will be the code for SEARCH?**

(a) 246173 **(b) 214673**
(c) 216473 (d) 214743

44. **Find the next number in the given sequence?**

11, 17, 39, 85, ?, 281, 447

(a) 133 (b) 143
(c) 153 **(d) 163**

45. **Find the missing number in the following series ?**

3, 5, 5, 19, 7, 41, 9,?, 11, 109

(a) **71** (b) 61
(b) 69 (d) 70

46. **Find the odd man out:**

34, 105, 424, 2123, 12756.

(a) 12756 **(b) 2123**
(c) 424 (d) 34

47. **Radha moves towards South-East a distance of 7 km, then she moves towards West and travels a distance of 14 km. from here she moves towards North –West a distance of 7 km and finally she moves a distance of 4 km towards east. How far is she now from the starting point?**

(a) 3 km (b) 4 km
(c) 10 km (d) 11 km

48. **P,Q,R and S are playing a game of carom P,R and S, Q are partners, 'S' is to the right of 'R'. If 'R' is facing West, then 'Q' is facing which direction?**

(a) South **(b) North**
(c) East (d) West

49. **One morning a boy starts walking in a particular direction for 6 Km and then takes a left turn and walks another 5 Km. thereafter he again takes left turn and walks another 5 Km and at last he takes right turn and walks 5 Km. Now he sees his shadow in front of him. What direction he did start initially?**

(a) South **(b) North**
(c) West (d) East

50. **It is 3'o clock in a watch. If the minute hand points towards the North-East then the hour hand will point towards the**

(a) South
(b) South – West
(c) North– West
(d) South – East

51. **A man is facing west. He turns 45 degree in the clockwise direction and then another 180 degree in the same direction and then 270 degree in the anticlockwise direction. Find which direction he is facing now?**

(a) South-East
(b) West
(c) South
(d) South-West

52. **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?**

(a) Brother-in-law
(b) Son
(c) Brother
(d) Nephew

53. **There are six children playing football namely A,B,C,D,E and F, A & E are brothers, F is sister of E, C is the only son of A's uncle, B & D are daughter of the brother of C's father. How D is related to A?**

(a) Uncle
(b) Cousin
(c) Nice
(d) Sister

54. **In a joint family, there are father, mother, 3 married sons and one unmarried daughter. Out of the sons, two have 2 daughters each and one has a son only. How many female members are there in the family?**

(a) 3
(b) 6
(c) 9
(d) 8

55. **When Rani saw Vinit, she recollected that "He is the brother of my grandfather's son". How is Rani related to Vinit?**

(a) Aunt
(b) Daughter
(c) Sister
(d) Niece

56. **Annanya is mother of Satya and Shyam is the son of Bhima, Shiva is brother of Annanya. If Satya is sister of Shyam, How Bhima is related to Shiva?**

(a) Son
(b) Cousin
(c) Brother-in-law
(d) Son-in-law

57. **Suman is daughter-in-law of Rakesh and sister-in-law of Rajesh, Ramesh is the son of Rakesh and only brother of Rajesh. Find the relation of Suman with Ramesh.**

(a) Sister-in-law
(b) Cousin
(c) Aunt
(d) Wife

58. **Pointing to a man in the photograph, Khushi says, "This man's son's sister is my mother –in-law," How is the Khushi's husband related to the man in the photograph?**

(a) Grandson
(b) Son
(c) Son in law
(d) Cousin

59. **Six persons A, B, C, D, E and F are sitting in two rows with three persons in each row. Both rows are in front of each other. E is not at the end of the any row and D is second left to the F, C is neighbor of E and diagonally opposite to D if B is neighbour F who is in front of C then who is sitting diagonally to F?**

(a) C
(c) A
(b) E
(d) D

60. **P,Q, R S and T are sitting in a line facing West. P and Q are sitting together. R is sitting at south end and S is sitting at North end. T is neighbor of Q and R. Who is sitting the middle?**

(a) P
(b) Q
(c) R
(d) S

61. **Which one of the following is source of primary data?**

(a) Government records
(b) Research Articles
(c) Journals
(d) Questionnaire filled by Enumerators

62. **Which is the left part of the table providing the description of the rows?**

(a) Captain
(b) Box head
(c) Stub
(d) Body

63. **The suitable formula for computing the number of class intervals is:**

(a) 3.322 logN
(b) 0.322 logN
(c) 1 + 3.322 logN
(d) 1 –3.322 logN

64. **Ogive for more than type and less than type distributions intersect at**

(a) Means
(b) Median
(c) Mode
(d) Origin

65. **If mean ($\bar{X}$) is = 10 and mode (Z) is = 7, then find out the value of median (M)**

(a) 9
(b) 17
(c) 3
(d) 4.33

66. **If the coefficient of variation and standard deviation are 30 and 12 respectively, then the arithmetic mean of the distribution is**

(a) 40
(b) 36
(c) 25
(d) 19

67. **_____ is based on all the observations and _____ is based on the central fifty percent of the observations.**

(a) Mean deviation, Range
(b) Mean deviation, quartile deviation
(c) Range, standard deviation
(d) Quartile deviation, standard deviation

68. **The relationship between two variable x and y is given by 4x – 10y = 20. If the median value of the variable x is 10 then what is median value of variable y?**

(a) 1.0
(b) 2.0
(c) 3.0
(d) 4.0

69. **Which one of the following is not a method of measures of dispersion?**
(a) Standard deviation (b) Mean deviation
(c) Range **(d) Concurrent deviation method**

70. **Mean deviation is minimum when deviations are taken from:**
(a) Mean **(b) Median**
(c) Mode (d) Range

71. **The median of the observations 42, 72, 35, 92, 67, 85, 72, 81, 51, 56 is**
(a) 69.5 (b) 72
(c) 64 (d) 61.5

72. **If the sum of square of the value equals to 3390, Number of observation are 30 and Standard deviation is 7, what is the mean value of the above observation?**
(a) 14 (b) 11
(c) 8 (d) 5

73. **The mean of 50 observations is 36. If two observations 30 and 42 are to be excluded, then the mean of the remaining observations will be:**
(a) 36 (b) 38
(c) 48 (d) 50

74. **If the variance of random variable 'x' is 17, then what is variance of y=2x+5?**
(a) 34 (b) 39
(c) 68 (d) 78

75. **If the variance of given data is 12, and their mean value is 40, what is coefficient of variation (CV)?**
(a) 5.66% (b) 6.66%
(c) 7.50% **(d) 8.65%**

76. **In a given set if all data are of same value then variance would be:**
(a) 0 (b) 1
(c) –1 (d) 0.5

77. **If Arithmetic mean between two numbers is 5 and Geometric mean is 4 then what is the value of Harmonic mean?**
(a) 3.2 (b) 3.4
(c) 3.5 (d) 3.6

78. **The average age of 15 students in a class is 9 years. Out of them, the average age of 5 students is 13 years and that 8 students is 5 years. What is the average of remaining 2 students?**
(a) 5 years (b) 9 years
(c) 10 years **(d) 15 years**

79. **Suppose A and B are two independent events with probabilities P(A) ≠ 0 and P(B)≠ 0. Let A' and B' be their complements. Which one of the following statements in FALSE?**
(a) $P(A \cap B) = P(A)P(B)$ (b) $P(A/B) = P(A)$
(C) $\boldsymbol{P(A \cup B) = P(A) + P(B)}$ (d) $P(A' \cap B') = P(A')P(B')$

80. **The Theorem of Compound Probability states that for any two events A and B.**
(a) $P(A \cap B) = P(A) \times P(B/A)$
(b) $P(A \cup B) = P(A) \times P(B/A)$
(c) $P(A \cap B) = P(A) \times P(B)$
(d) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

81. **A machine is made of two parts A and B. The manufacturing process of each part is such that probability of defective in part A is 0.08 and that B is 0.05. What is the probability that the assembled part will not have any defect?**
(a) 0.934 (b) 0.864
(c) 0.85 **(d) 0.874**

82. **If $P(A) = \frac{1}{3}, P(B) = \frac{3}{4}$ and $P(A \cup B) = \frac{11}{12}$ then $P\left(\frac{B}{A}\right)$ is :**
(a) $\frac{1}{6}$ (b) $\frac{4}{9}$
(c) $\frac{1}{2}$ (d) $\frac{1}{8}$

83. **The probability that is leap year has 53 Monday is:**
(a) 1/7 (b) 2/3
(c) 2/7 (d) 3/5

84. **If a number is selected at random from the first 50 natural numbers, what will be the probability that the selected number is a multiple of 3 and 4?**
(a) 5/50 **(b) 2/25**
(c) 3/50 (d) 4/25

85. **If three coins are tossed simultaneously, what is the probability of getting two heads together?**
(a) ¼ (b) 1/8
(c) 5/8 **(d) 3/8**

86. **If the first quartile in 56.50 and the third quartile is 77.50 then the co-efficient of quartile deviation is**
(a) 618.09 **(b) 15.67**
(c) 63.80 (d) 156.71

87. **Skewness of Normal Distribution is –**
(a) Negative (b) Positive
(c) Zero (d) Undefined

88. **If Poisson distribution is such that P(X = 2) = P(X = 3) then the variance of the distribution is**
(a) $\sqrt{3}$ **(b) 3**
(c) 6 (d) 9

89. **The Standard Deviation of Binomial distribution is:**
(a) npq **(b) $\sqrt{npq}$**
(c) np (d) $\sqrt{np}$

90. **The speeds of n number of bikes follow a normal distribution model with a mean of 83 km/hr and a standard deviation of 9.4 km. /hr. Find the probability that a bike picked at random is travelling at more than 95 km/hr.?**

(a) 0.1587 (b) 0.38
(c) 0.49 (d) 0.278

Note:
Correct answer is P(x>95) = 1 - P(x<95) = 0.10087, ICAI has not given the correct answer follows the correct answer

91. **The equations of the 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

92. **The regression equation are 2x + 3y + I = 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

93. **If b yx = 0.5, b xy = 0.46 then the value of correlation coefficient is:**

(a) 0.23 (b) 0.25
(c) 0.39 **(d) 0.48**

94. **The coefficient of rank correlation between the ranking of following 6 students in two subjects Mathematics and Statics is:**

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

(a) 0.25 (b) 0.35
(c) 0.38 (d) 0.20

Note:
Correct answer is –0.2571, ICAI has not given the correct answer follows the correct answer

95. **Pearson's correlation Coefficient between x and y is :-**

(a) $\frac{cov\,(x,y)}{S_x \cdot S_y}$ (b) $\frac{cov^2\,(x,y)}{S_x \cdot S_y}$

(c) $\frac{(S_x, S_y)^2}{cov\,(x,y)}$ (d) $\frac{(S_x,\ S_y)}{cov\,(x,y)}$

96. **From the following data constructed the index number by laspeyre's method**
$\Sigma P_1Q_1 = 99, \Sigma P_0Q_1 = 76, \Sigma P_0Q_0 = 73, \Sigma P_1Q_0 = 96$

(a) 130.36 **(b) 131.51**
(c) 130.59 (d) 76.01

97. **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

98. Fisher's index number is called as ideal index number because is in satisfies.

(a) Factor reversal test
(b) Time reversal test
(c) Both factor and time reversal test
(d) Circular test

99. If Laspeyre's Index is 119 and Paasche's Index is 112. Then Fisher's index number will be.

(a) 113.99
(b) 115.45
(c) 115.89
(d) 151.98

100. 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

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JUNE 2023

CA FOUNDATION | JUNE 2023 ATTEMPT | BUSINESS MATHEMATICS, STATISTICS & LOGICAL REASONING | MEMORY BASED QUESTION PAPER

1) Evaluate the integral $\int \frac{1}{(x-1)(x-2)} dx$

a) $\log\left(\frac{x-2}{x-1}\right) + c$

b) $\log([(x-2)(x-1)]) + c$

c) $\log\left(\frac{x-1}{x-2}\right) + c$

d) $\log([(x-2)(x+1)]) + c$

2) Given the relation R = {(1, 2), (2, 3)} on the set A = {1, 2, 3} then the minimum number of ordered pairs which when added to R make it is equivalence relation.

a) 5 b) 7 c) 6 d) 8

3) For a given **Curve** $y = 2 - x^2$ when x increase at the rate of 3 units/s then the slope of the curve will be

a) Increase at 6 units/s

b) Increase at 3 units/s

c) Decrease at 6 units/s

d) Decrease at 3 units/s

4) If the 9th and 19th terms of A.P are 35 and 75 respectively then its 20th term is.

a) 78 b) 79 c) 80 d) 81

5) The share holding pattern of ABC Ltd. Is as follows.

Share holders	Promoter	F II	D II	Others	Public
No. of shares in million	120	25	20	20	15

What is the difference between central angles in degrees for share holders promoter and public in pie – chart?

a) 216 b) 189 c) 180 d) 99

6) 4x + 3y + 11 = 0, then mean deviation of y = 7.20. find the mean deviation of x?

a) 2.70 b) 7.20 c) 4.50 d) 5.40

7) A professor has assigned a work to students in a statistics class. A student jagan computer the AM & SD for a net of 100 observations as 50 & 5 respectively. Later on sonali points out to jagan that he has made mistake in taking one observations as 100 instead of 50. What would be the correct $\bar{x}$ if the wrong observations in corrected.

a) 50.5 b) 49.9 c) 49.5 d) 50.1

8) Calculate $\bar{x}$ for the following:

CA	10-20	20-30	30-40	40-50	50-60	60-70	70-80
f	9	13	6	4	6	2	3

a) 23.7 b) 35.7 c) 39.7 d) 45.7

9) Consider the data

Year	Base year		Current year	
Commo-dities	Price	Quantity	Price	Quantity
A	10	5	20	2
B	15	4	25	8
C	40	2	60	6
D	25	3	40	4

Laspeyre's Index is

a) 166.04 b) 166.40

c) 164.04 d) 164.40

10) Which of the following index is computed by taking the average of base year and current year.

a) Marshall-Edgeworth Index

b) Paasche's Index

c) Laspeyre's Index d) Fisher's Index

11) The index number of prices for a country at a given date is 250 in comparison to the base period price, the price of all commodities in the country has increased by _____ times.

a) 1.25 b) 1.5 c) 2 d) 2.5

12) If Fisher's index number is 160 and Paasche's index numbers is 140, then Laspeyer's index number is

a) 147.77 b) 182.85

c) 183.35 d) 146.25

13) The number of words can be formed using the letters of the word 'SOFTWARE' so that vowels always coming together.

a) 720 b) 1440 c) 2880 d) 4320

14) Given that 74% canadian like grapes and 71% canadian like bananas then the percentage of canadians like both grapes and bananas if every body likes atleast one fruit is

a) 25% b) 35% c) 45% d) 60%

15) If xy = 1 then $y^2 + \frac{dy}{dx}$

a) 1 b) 0 c) - 1 d) ½

16) In the next world cup of cricket, there will be 12 teams, divided equally in to two groups. Teams of each group will play a match against other. From each group 3 top teams will qualify for the next round. In this round each team will play against others once. Four top teams of this round, will qualify for the semi final round, where each team will play against the others once. Two top teams of this round will go to final round, where they will play the best of three matches. How much minimum number of matches in the next world cup will be.

a) 54 b) 53 c) 38 d) 43

17) The following table represents the income of 86 persons.

Income	500-999	1000 - 1499	1500 - 1999	2000 - 2499
No. of persons	15	28	36	7

What is the percentage of persons earning at least ₹1,500 per _____.

a) 50% b) 45% c) 40% d) 60%

18) There are six persons A, B, C, D, E and F in a family. A and B are a married couple and A is a male member. D is the only son of C, who is the brother of A, E is the sister of D. B is the daughter-in-law of F, whose husband was dead. Who is the mother of C?

a) A b) E c) D d) F

19) For tabulation 'Caption' is

a) Upper part b) Lower part
c) Main part
d) Upper part of columns and sub columns.

20) For moderately skewed distribution marks in statistics for a group of 200 students mean mark and median mark were found to be 55.60 and 52.40 mode marks.

a) 54.48 b) 48 c) 53.56 d) 46

21) Weighted GM Satisfies _____ test while factor reversal test will be satisfied by _____.

a) Time reversal test, Fishers Idle Index number
b) Time reversal test, Laspeyers Index
c) Factor Reversal test, Paasches Index
d) Factor reversal test, Fishers Idle Index number

22) Find Population limits if r = 0.4 & n = 81

a) 0.3370, 03.4725 b) 0.338, 0.487
c) 0.347, 0.568 d) 0.462, 0.338

23) Spearmans rank corelation coefficient is given by

a) $1-\frac{6\sum d^2}{n(n^2-1)}$ b) $1-\frac{4\sum d^2}{n(n^2-1)}$
c) $1-\frac{6\sum d^2}{n(n^2+1)}$ d) $1-\frac{4\sum d^2}{n(n^2+1)}$

24) If the Regression equation x + 2y – 5 = 0 and 2x + 3y – 8 = 0 mean of x and mean of y

a) -3 and 4 b) 2 & 4
c) 1 and 2 d) 2 and 1

25) A committee of 3 women and 4 men is to be formed out of 8 women and 7 men. Mrs. Kajal refuses to serve in a committee in which Mr. Yash is a member. The number of such committees can be

a) 1530 b) 1500 c) 1520 d) 1540

26) The Nominal rate of interest is 10% per annum the interest is compounded quarterly. The effective rate of interest per annum will be.

a) 10% b) 10.10%
c) 10.25% d) 10.38%

27) If a car is available for Rs.4,98,200 cash payment or Rs.60,000 cash down payment followed by three equal annual instalments. If the rate of interest charged is 14% per annum compounded yearly. then total interest charged in the installment plan is?
Given p (3,0.14) = 2.32163

a) ₹ 1,46,314 b) ₹1,46,137
c) ₹ 1,58,040 d) ₹ 1,28,040

28) If $6_{p_{2r}} = 12 \times 6_{P_r}$ then r is equal to

a) 1 b) 2 c) 3 d) 4

29) How many numbers between 74 and 25556 which are divisible by 5 is

a) 5090 b) 5097 c) 5095 d) 5075

30) Neelima, who is the daughter of Deepak say to Deepika, yours mother-in-law Rekha is the youngest daughter of Ramlal, who is my grandfather. How is Deepika related to Neelima?

a) Niece b) Sister
c) Sister-in-law d) Aunt

31) P, Q, R, S, T, U are 6 members of a family in which there are two married couples T, a teacher is married to a doctor who is mother of R & U. Q the lawyer is married to P. P has one son & one grandson. Of the two married ladies one is a housewife. There is also one student and one male engineer in the family. Which of the following is true about grandson of the following?

a) Lawyer b) Engineer
c) Student d) Doctor

32) Pointing to a photograph A Women's said. "this man's son's sister is my mother-in-law "How is Women's husband related to the man in the photograph?

a) Son b) Son-in-Law
c) Grandson d) Nephew

33) A is the brother of B, B is the daughter of C, and D is the father of A, then how is C related to D

a) Husband b) Wife
c) Grand Daughter d) Grand Father

34) For variable X and Y, we collect the four observations $\sum X = 10$; $\sum Y = 14$; $\sum X^2 = 65$; $\sum Y^2 = 5$; $\sum XY = 3$, What is regression line of Y on X?

a) Y = - 0.8X – 5.5 b) Y – 0.8X – 5.5
c) Y = -0.8X + 5.5 d) Y = 0.8X + 5.5

35) If a Poisson distribution is such that P(X-=2) = $\frac{1}{3}$ P (X=3), then the standard deviation of the distribution is:

a) $\sqrt{3}$ b) 3 c) 2 d) 1

36) If a random variable X has the following probability distribution, then the expected value of X is:

X	-1	-2	0	1	2
F(x)	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{3}$

a) $\frac{3}{2}$ b) $\frac{1}{2}$ c) $\frac{1}{6}$ d) $\frac{1}{3}$

37) The regression lines will be perpendicular to each other when value of r is _____.

a) 1 b) -1 c) ½ d) 0

38) If the discount rate is 10% per annum, how much amount would you pay to receive ₹ 2,500 growing at 8%, annually forever?

a) ₹ 1,25,000 b) ₹ 2,50,000
c) ₹ 1,50,000 d) ₹ 2,00,000

39) The C.I on ₹ 15,625 for 9 months at 16% p.a. when interest is compounded quarterly is:

a) ₹ 1,851 b) ₹ 1,941
c) ₹ 1,951 d) ₹ 1,961

40) Mr. Sharad got his retirement benefit amounting to ₹ 50,00,000. He want to receive a fixed monthly sum of amount for his rest of life, starting after one month and there after he wants to pass on the same to future generation. He expects to earn and interest of 9% compounded annually. Determine how much perpetuity amount he will receive every month?

a) ₹ 39,500 b) ₹ 38,500
c) ₹ 37,500 d) ₹ 36,600

41) Jonny wants have to Rs.2,00,000 in his savings account after 3 years. The rate of interest offered by bank 8% per annum compounded annually. How much should be invest today to achieve his target amount.

a) 1,47,489.10 b) 1,71,035.59
c) 1,58,766.44 d) 1,84,417.96

42) X is the husband of Y, W is the daughter of X, Z is husband of W, N is daughter of Z. Who is Y to N.

a) Cousin b) Niece
c) Daughter d) Grand Mother

43) Sunitha walks a distance of 2 km towards east and turns left and walks 1 km. then turns left and walks for 2 km and then turns left and walks for 1km then halts, at what distance Sunitha is now from the starting point?

a) 0 km b) 1 km
c) 2 km d) 5 km

44) Six friends A, B, C, D, E & F sitting around a circular table facing centre. E is not between B & D, A is to the left of F, C is fourth to the right of A, D is immediate right of E, then who sits second to the right of F?

a) C b) A c) D d) B

45) Based on the statements give below, find out who is the uncle of P?

i) K and J are brothers
ii) K's sister is M
iii) P and N are siblings
iv) N is the daughter of J

a) K b) M c) N d) None

46) Four persons are chosen at random from a group of 3 men, 2 women and 4 children. The probability that exactly 2 of them are children is.

a) $\frac{10}{21}$ b) $\frac{1}{12}$ c) $\frac{1}{5}$ d) $\frac{1}{9}$

47) 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.

a) 0.1696 b) 0.01696
c) 0.1643 d) 0.01643

48) If P(A) = 1/3, P(B) = ¼ and P(A/B) = 1/6, Then P(B/A) is

a) 1/8 b) ¼ c) 3/8 d) ½

49) Ms. Paul invested Rs.1,00,000 in a mutual fund scheme in January 2018 after one year in January 2019, She got a dividend amounting to Rs.10,000 for the first year Rs.12,000 for second year, Rs.16,000 for third year, Rs.18,000 for fourth year Rs.21,000 for fifth year in January 2023. What is compounded Annual growth rate (CAGR) of dividend return? $(1.2038)^4 = 2.1$

a) 20.38% b) 18.59%
c) 16.36% d) 15.89%

50) Suppose you have decided to make a Systematic Investment Plan (SIP) in a mutual fund with Rs.1,00,000 every year from today for next 10 years where you get return of 10% per annum compounded annually. What is the future value of annuity? Given $(1.1)^{10} = 2.59374$

a) Rs.17,35,114 b) Rs.17,53,411
c) Rs.17,35,411 d) Rs.17,53,116

51) Mr. Ram invested a total of ₹ 1,00,000 in two different banks for a fixed period. First bank yields an interest of 9% per annum and second 11% per annum, if the total interest at the end of one year is 9.75% per annum S.I. Then the amount invested in the two banks respectively are.

a) ₹ 52,500, ₹ 47500
b) ₹ 62,500, ₹ 37,500
c) ₹ 57500, ₹ 42,500
d) ₹ 67500, ₹ 32,500

52) A company wants to replace the machinery at the end of the 10 years. Expected cost of machine would be ₹ 10,00,000. If the management of the company has to maintain a sinking fund. How much provision needs to be make out of profits each year which can earn at the rate of 10% compounded annually. Find the amount of each annual deposit (Given A (10,0.10) = 15.937425)

a) ₹ 74,635 b) ₹ 72, 514
c) ₹ 62, 745 d) ₹ 67,245

53) Seven friends A, B, C, D, E, F and G are watching TV. E is at extreme end, C is sitting second to E, B is sitting between C and A. G is not at extreme end. A is not at any extreme end and D is sitting immediate to F, then who is sitting at middle.

a) A b) B c) C d) F

54) Deepika starts walking straight towards east. After walking 65M turns to left and walks 25 m straight. Again she turns to the left and walked a distance of 40 m. At what distance and in which direction currently she is from the starting point?

a) 35.35M in North-East
b) 35.35M in South - West
c) 25M in North d) 25M in West

55) Mr. Karthik puts his tune piece on the table in such a way that at 6 pm hours hand points to north. In which direction the minute hand will point at 9.15 pm?

a) East b) West c) North d) South

56) Srikanth is facing East and turns 120^0 in the clock wise direction and then 180^0 in the anti-clock wise direction. Which direction is Srikanth facing now?

a) East b) North - East
c) North d) South - West

57) Company 'A' produces 10% defective products, company 'B' produces 20% defective products and company 'C' produces 5% defective products. If choosing a company is an equally likely event. What is probability is that a product chosen is free from defect?

a) 0.88 b) 0.80 c) 0.79 d) 0.78

58) Between 9 AM & 10 AM the average number of phone call per minute coming into the switchboard of a company is 4. Find the probability during a particular minute there will be either 2 phone calls or no phone calls. ($e^{-4} = 0.0183$).

a) 0.156 b) 0.165 c) 0.149 d) 0.194

59) The probability distribution of x is given below

Value of x	1	0	Total
Probability	P	1-p	1

Mean is equal to

a) p b) 1-p c) 0 d) 1

60) For any two events A and B it is known that P(A) = 2/3, P(B) = 3/8 and P(A∩B) = ¼. Then the events A and B are

a) Mutually exclusive and independent

b) Mutually not exclusive and independent

c) Mutually exclusive but not independent

d) Neither independent nor mutually exclusive

61) A machine depreciates at 10% of its value at the beginning of the year which the cost and scrap value realized at the time of sale being ₹ 23,240 and ₹ 9,000. Then approximately for how many years the machine put to use.

a) 7yrs b) 8yrs c) 9yrs d) 10yrs

62) The difference between C.I and S.I on a certain sum of money invested for 3 years at the rate of 6% per annum is Rs.110.16 then principle is

a) ₹ 3,000 b) 3,700

c) 10,000 d) 12,000

63) The population of a town increases every year by 2% of the population at the beginning of the year. The approximate number of years by which the total increase of population will be 40% is. Given $(1.02)^8 = 1.17160$

a) 15y b) 17y c) 19y d) 20y

64) Govinda's mother decides to gift him Rs.50,000 every year starting from today for the next 5 years. Govinda deposits this amount in a bank as and when he receive and gets 10% per annum interest rate compounded annually. What is the present value of the annuity?

Given P (4,0.10) = 3.16987

a) ₹ 2,80,493.5 b) ₹ 2,08,493.5

c) ₹ 2,08,914.5 d) ₹ 2,58,493.5

65) Find the next number in the series: QIF, S2E, U6D, W21C, ……..?

a) Y66B b) Y44B

c) Y88B d) Z66B

66) Five boys Ajay, Brijmohan, Chandru, Dheeraj and Ehsan are sitting in a park around a circle facing the center, Ajay is facing South-West, Dheeraj is facing South-East, Brijmohan and Ehsan are right opposite Ajay and Dheeraj respectively, Chandru is equidistance between Dheeraj and Brijmohan. Which direction is Chandru facing?

a) West b) South

c) North d) East

67) Pran, Komal, Ravi, Shalu, Trilok, Urvi, Chandru and Walter are sitting in a row facing North.

i) Pran is forth to the right of Trilok.

ii) Walter is forth to the left of Shalu.

iii) Ravi and Urvi which are not at the ends are neighbours of Komal and Trilok.

iv) Walter is immediate left of Pran and Pran is the neighbour of Komal.

Identify who are seating at the extreme ends.

a) Pran & Walter b) Trilok & Urvi

c) Trilok & Shalu d) Shalu & Pran.

68) Find the Odd man of the following series

190, 145, 136, 352, 460, 324, 631, 249?

a) 136 b) 244 c) 460 d) 324

69) The probability that a four-digit number comprising the digits 2, 5, 6 and 7 with repetition of digits would be divisible by 4 is.

a) ½ b) ¾ c) ¼ d) 1/3

70) The Geometric Means of 3, 7, 11, 15, 24, 28, 30, 0 is _____.

a) 6 b) 0 c) 9 d) 12

71) If the first quartile is 42.75 and the third quartile is 74.25, then the _____ quartile deviation is:

a) 29.62 b) 15.75

c) 17.57 d) 25.92

72) On a commodity exchange when booking trades with provision for stop – trader can make a profit of rupees 50,000 or incur a loss of rupees 20,000. The probability of making profit and incurring loss is 0.75 and 0.25 respectively. The expected profit for the trader should be _____.

a) ₹ 32, 500 b) ₹35, 000

c) ₹ 30,000 d) ₹35, 500

73) If α and β are roots of the quadratic equation $x^2 - 2x - 3 = 0$,then the equation whose roots are α + β and α – β is.

a) $x^2 - 6x - 8 = 0$ b) $x^2 - 6x + 8 = 0$
c) $x^2 + 6x + 8 = 0$ d) $x^2 + 6x - 8 = 0$

74) The value of $[\log_{10}(5 \log_{10}100)]^2$ is:

a) 1 b) 2 c) 10 d) 25

75) If $\sqrt[3]{a} + \sqrt[3]{b} + \sqrt[3]{c} = 0$ then the value of $\left(\frac{a+b+c}{3}\right)^3$ is equal to

a) abc b) 9 abc
c) 1/(abc) d) (1/9)abc

76) The largest side of a triangle is 3 times the shortest side and the third side is 4 cm shorter than the largest side. If the perimeter of the triangle is at least 59 cm, what is the length of the shortest side?

a) Less than 7 cm
b) Greater than or equal to 7 cm
c) Less than 9 cm
d) Greater than or equal to 9 cm

77) If α and β are the roots of the equation $x^2 - (n^2+1)x + \frac{1}{2}(n^4+n^2+1) = 0$ then the value of $\alpha^2 + \beta^2$ is

a) 2n b) n^2 c) $2n^2$ d) n^3

78) The number in the place of question mark in 7, 26, 63, 124, 215, ___, 511

a) 342 b) 343 c) 441 d) 421

79) If $Y = \frac{x}{x+5}$ then $\frac{dx}{dy}$

a) $\frac{5}{(1-y)^2}$ b) $\frac{5}{(1+y)^2}$
c) $\frac{3}{(1-y)^2}$ d) $\frac{3}{(y+1)^2}$

80) In a certain code, MENTION is written as "LNEITNO". How is PRESENT in that code?

a) OFSFTUM b) ONESERO
c) QRESTNO d) OERESTN

81) Out of the following 41, 43, 47, 53, 61, 71, 83, 95 the odd man out shall be

a) 95 b) 83 c) 71 d) 53

82) Mean deviation about mean for the data 12, 16, 24, 30, 35, 39, 40.

a) 9.14 b) 9.44 c) 8.94 d) 9.84

83) 24, 18, 36, 42, 30, 28, 24, 29, 25, 33 then median.

a) 26.5 b) 27.5 c) 28.5 d) 29.5

84) What does an Ogive curve represent?

a) The Cumulative frequency & class boundary
b) The frequency & class boundary
c) the frequency & cumulative frequency
d) the frequency & class interval

85) Find the mode of the following data

x	25-30	30-35	35-40	40-45	45-50	50-55
f(x)	20	53	42	42	41	43

a) 31.75 b) 30.75 c) 33.75 d) 35.75

86) If the standard deviation of data 2, 4, 6, 8, 17, is 4.47 then find SD for the data 4, 8, 10, 12, 16, 34, is

a) 4.47 b) 8.94 c) 13.44 d) 2.24

87) In a garment factory, on an average experienced tailor can stich 5 shirts, while the in-experienced tailor can stich 3 shirts daily but the employer has to maintain minimum of 30 shirts stretched per day. This can be formulated as

a) $5x + 3y \leq 30$ b) $5x + 3y \geq 30$
c) $5x + 3y \geq 30\ x \geq 0\ y \geq 0$
d) $5x + 3y \leq 30\ x \leq 0\ y \leq 0$

88) If the age of a man is four times to the sum of ages of his two sons. After ten years his age will be double the sum of their ages. What is the present age of the man is.

a) 56 b) 45 c) 60 d) 64

89) Given that $\log_{10} x = m + n - 1$, $\log_{10} y = m - n$ then the value of $\log_{10}(100x/y^2)$ expressed in terms of m and n is

a) 1 – m + 3n b) m + 3n – 1
c) m + 3n + 1 d) $m^2 - n^2$

90) A fertilizer company produces two types of fertilizers called Grade I and Grade II. Each of these types is processed through a chemical plant unit. The maximum of 180 hours available in a week. Manufacturing one bag of grade I fertilizer requires 4 hours in the plant. Manufacturing one bag of Grade II requires 10 hours in the plant. Express this using liner inequalities.

a) $2x_1 + 5x_2 \leq 180$
b) $4x_1 + 10x_2 > 180$
c) $2x_1 + 5x_2 > 180$
d) $4x_1 + 10x_2 \leq 180$

91) If $x = y^a$, $y = z^b$, $z = x^c$ then abc = ?

a) 1 b) 2 c) 3 d) 4

92) Let R be a relation defind on the set of natural numbers as "xRy"⇔ (x-y) is divisible by 5 ∀x,y∈N then the relation R is.

a) Equivalence
b) Antisymmetric
c) Symmetric but not transitive
d) Symmetric but not reflexive

93) If the 4th, 7th & 10th terms on G.P are p,q,r respectively then

a) $P^2 = q^2 + r^2$ b) $p^2 = qr$
c) $q^2 = pr$
d) pqr + pq + 1 = 0

94) If A = {a, b, c}, B = {b, c, d} and C = {a, d, c} the (A - B) x (B ∩ C) is equal to

a) {(a, d), (c, d)}
b) {(a, c), (a, d)}
c) {(c, a), (d, a)}
d) {(a, c), (a, d) (b, d)}

95) If $f(x) : N \to R$ is a function defend as $f(x) = 4x + 3$, ∀x∈N, then $f^{-1}(x) = C$

a) $4 + \frac{x+3}{4}$ b) $\frac{x+3}{4}$
c) $\frac{x-3}{4}$ d) $\frac{3x+4}{4}$

96) The Mode of presentation of data are:

a) Textual, Diagrammatic and Internal presentation
b) Tabular, Textual and Internal Presentation
c) Textual, Tabular and Diagrammatic presentation
d) Tabular, Diagrammatic and Internal Presentation

97) The mean and variance of group of 100 observations are 8 and 9, the mean and standard deviation of 60 observations are 10 and 2 respectively, find the standard deviation of remaining 40 observations.

a) 4.5 b) 3.5 c) 2.5 d) 1.5

98) For a given data set: 5, 10, 3, 6, 4, 8, 9, 3, 15, 2, 9, 4, 19, 11, 4, what is median?

a) 8 b) 6 c) 4 d) 9

99) If the mean of two numbers is 30 and geometric mean is 24 then what will be the harmonic mean of two numbers?

a) 19.2 b) 21.8 c) 22.3 d) 18.4

100) For a given set of normally distributed data, the following statistical parameters observed: Mean = 6, standard deviation = 2.6, Median = 5 and Quartile deviation = 1.5. then coefficient of Quartile deviation is equals to

a) 30 b) 32 c) 25 d) 39

THE END

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SEP 2024

Question 1

In which of the following there is no impact of presence of extreme observations?

A. Range
B. Quartile deviation
C. Standard deviation
D. Variance

Question 2

If each observation of a set is divided by 10, then the Standard Deviation of the new observation is:

A. 1th/ 100 of Standard Deviation of original observation
B. 1th/10 of Standard Deviation of original observation
C. 100 times of Standard Deviation of original observation.
D. 10 times of Standard Deviation of original observation.

Question 3

If the mean and median of a moderately asymmetrical series are 70.8 and 68.6 respectively, then the most probable mode is:

A. 75.2
B. 64.2
C. 63.4
D. 72.5

Question 4

For a moderately. Skewed distribution, which of the following relationship holds?

A. (A) Median-Mode 3 (Mean - Median)
B. (B) Mean-Mode=3 (Mean-Median)
C. (C) Mean-Median 3 (Mean-Mode)
D. (D) Mean Median 3 (Median - Mode)

Question 5

What is the coefficient of range for the observations 20, 28, 32, 41, 48, 60?

A. 20

B. 50
C. 40
D. 200

Question 6

Which one holds correct for any two events A and B 7

A. P(A-B) = P(A) - P(AΠB)
B. P(A-B)= P(A)-P(B)
C. P(A-B) = P(B) - P(A∩B)
D. P(A-B) = P(B) + P(A∩B)

Question 7

The Standard Deviation of the series 3, 6, 9, 12, 15 is:

A. 6.36
B. 4.24
C. 4.12
D. 3.28

Question 8

The quartile deviation of the distribution of the following data is:

x	2	3	4	5	6
f(x)	2	4	8	4	1

A. 1
B. 0
C. 1/4
D. 1/2

Question 9

Which of the following pairs pairs of events are mutually exclusive ?

A. A: Archna was born in India. B: She is a fine lawyer.
B. A: The student studies in a school. B: He studies Geography.
C. A: Sita is 16 years old. B: She is a good folk dancer.
D. A: Imran is under 15 years of age. B: He is a voter of Delhi.

Question 10

A. 3/4
B. 2/5

C. 1/6
D. 1/5

Question 11

If P(A)=0.65 and P(B)=0.15, then P(A) + P(B) is:

A. 1.2
B. 0.8
C. 1.5
D. 0.35

Question 12

Eight labourers are working at a each day of working (in 2): following wages for each day of working (in ₹):

500, 620, 400, 700, 450, 560, 320, 450

If one of the workers is selected at what is the probability that his wage would be less than the average wage?

A. 0.375
B. 0.625
C. 0.500
D. 0.450

Question 13

A box contains shoc pairs of same pattern of different sizes numbered from 1 to 12. If a shoc pair is selected at random, what is the probability that the number on the shoe pair will be a multiple of 5 or 6?

A. 0.25
B. 0.20
C. 0.33
D. 0.375

Question 14

Two cards are drawn at random from a pack of 52 cards. The probability of getting either both the red cards or both Kings cards is

A. 0:4288
B. 0.2488
C. 0.8248

D. 0.8428

Question 15

In a class of 100 students, the mean marks was 50 with standard deviation 14.9. Assuming the distribution of marks to be normal, find the number of students who obtained more than 70% marks [at z = 1.34 area=0.4099].

A. 9
B. 8
C. 10
D. 7

Question 16

If a random variable X follows Poisson distribution such that that P(x - 1) = P(X = 2), then the mean of the distribution is:

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

Question 17

The quartile deviation of a normal distribution with Mean of 10 and Standard Deviation of 4 is:

A. 3.20
B. 2.70
C. 0.675
D. 6.75

Question 18

If X and Y are 2 independent normal variables with mean as 10 and 12 and Standard Deviation (S.D.) as 3 and 4 respectively, then (X + Y) distributed is normally

A. Mean = 22 and S.D. = 25
B. Mean = 22 and S.D. = 7
C. Mean = 22 and S.D. = 5
D. Mean = 22 and S.D. =49

Question 19

The number of accidents in a year attributed to taxi drivers in a locality follows Poisson distribution with average 2. Out of 500 taxi drivers of that area, what is the number of drivers with at least 3 accidents in a year? (Given that e = 2.718)

A. 180
B. 162
C. 201
D. 190

Question 20

Which of the following statement is correct?

A. Regression coefficients are independent of origin and scale.
B. Both regression coefficients must be less than unity.
C. The regression lines of two independent variables are parallel to each other.
D. If two regression lines coincide with each other, there is no correlation between the variates.

Question 21

Which, one of the following statement is correct regarding limit regression of the two regression coefficients?

A. Must be positive.
B. No limit.
C. One positive and the other negative
D. Product of the regression coefficients be numerically less than unity.

Question 22

In case of "Insurance profits" and "The number of claims they have to pay", there exists a:

A. Negative correlation
B. Positive correlation
C. No correlation
D. It cannot be predicted

Question 23

The variance of two variables 'x' and 'y' are 16 and 25 and covariance between 'x' and 'y' is 18.5. Another two variables 'u' and 'v' are defined as u = (x-3)/2 and v = (y-2)/3, then coefficient of correlation between 'u' and 'v' is:

A. 0.875

B. 0.85
C. 0.90
D. 0.925

Question 24

The courses price Index for the year 2021 is 273 with 1010 as base year. The average monthly wages of Industrial worker in year 2023 is ₹ 8,190. What is the real wage?

A. ₹ 3,000
B. ₹ 2,800
C. ₹ 3,200
D. ₹ 3,400

Question 25

Time Reversal test is satisfied by

A. Paasche's method but not Laspeyre's method
B. Laspeyre's method but not Fisher's method
C. Fisher's method
D. Laspeyre's method and Fisher's method

Question 26

A. The total sum of the values of a give the base year. plus the sum of the values of
B. The total sum of the values of a given year multiplies by sum of the values of the base year.
C. The total values of the base year of a given year divided by the sum of the
D. The total sum of the values of a given year minus the sum of the values of the base year.

Question 27

A. Gain by ₹ 75
B. Gain by ₹ 50
C. Loss by ₹ 90
D. Loss by ₹ 50

Question 28

Which one of the following test of adequacy is concerned with the measurement of price changes over a period of years, when it is desirable to shift the base?

A. Time Reversal test
B. Unit test
C. Circular test
D. Factor Reversal test

Question 29

What is the value for $(x^b/ x^c)^{(b + c - a)} \times (x^c/ x^a)^{(c + a - b)} \times (x^a/ x^b)^{(a + b - c)}$

A. $x^{(a+b+c)}$
B. x^{abc}
C. -1
D. 1

Question 30

A number consists of two digits. The digits in the ten's place is 3 times the digit in the unit's place. If 54 is subtracted from the number, then the digits are reversed. The number is:

A. 62
B. 39
C. 93
D. 31

Question 31

A person purchased 2 apples and 5 bananas banana, I can give you 3 apples. He apple and one banana? to another shop where shopkeeper told him that if you give me 50 and one of 90. Later he visited the cost of one apple and one banana?

A. (10,15)
B. (15,10)
C. (10,20)
D. (20,10)

Question 32

The ratio of income of A and B is 5 : 4 and their expenditure is 3 : 2. If at the end of year each saves ₹1,600, then the income of A is:

A. ₹ 3,600

B. ₹ 3,400
C. ₹ 4,000
D. ₹ 4,400

Question 33

The mean proportional between $12x^2$ and $27y^2$ is:

A. 81xy
B. 18xy
C. 8xy
D. 19.5xy

Question 34

$\log_2 \log_2 \log_4 256 + 2 \log \sqrt{2}2$ is equal to:

A. 3
B. 2
C. 5
D. 7

Question 35

A dietician recommends mixture of two kinds of foods to a person so that mixture contains at least 45 units of carbs, 25 units of protein, 15 units of fat and 15 units of fibre. The above contents of nutrients are available in the foods as below:

	Carbs	Protein	Fat	Fibre
Food - 1	20	5	3	2
Food - 2	10	2	4	5

If 'r' units of food-1 is mixed with 's' units of food-2, how dietician recommendation can be expressed?

A. 20x + 10y <= 25; 5x + 2y >= 45; 3x + 4y <= 15; 2x + 5y >= 15; x >= 0; y >= 0;
B. 20x + 10y <= 45; 5x + 2y >= 25; 3x + 4y <= 15; 2x + 5y >= 15; x >= 0; y >= 0;
C. 20x + 10y >= 45; 5x + 2y >= 25; 3x + 4y >= 15; 2x + 5y >= 15; x >= 0; y >= 0
D. 20x + 10y <= 45; 5x + 2y <= 25; 3x + 4y <= 15; 2x + 5y <= 15; x >= 0; y >= 0

Question 36

If one of the root of the equation x then the value of 'k' is:

A. 1

B. 2
C. -2
D. -1

Question 37

If one of the root of the cubic equation 3x ^ 3 - 5x ^ 2 - 11x - 3 = 0 is - 1/3 other two roots are:

A. -1 & 3
B. 1 & 3
C. 1 \&-3
D. -1 &-3

Question 38

The shaded area is represented by which of the following option?

A. $x + y < 6; 2x - y > 0; x < 0$
B. $x + y > 6; 2x - y > 0; x > 0$
C. $x + y > 6; 2x - y < 0; x > 0$
D. $x + y > 6; 2x - y > 0; x < 0$

Question 39

The value of a machine depreciates every year at the rate of 10% per annum, on its value at the beginning of that year, If the present value of the machine is 72,900, then machine's worth 3 years ago was:

A. ₹ 80,000
B. ₹ 94,710
C. ₹ 1,00,000
D. ₹ 75,087

Question 40

What is the effective rate of interest when principal amount of ₹ 50,000 deposited in a nationalized bank for one year, corresponding to a nominal rate of interest 6% per annum payable half yearly ?

A. 6.07%
B. 6.06%
C. 6.08%
D. 6.09%

Question 41

Kanta wants to accumulate ₹ 4,91,300 in her saving accountafter three years. The rate of interest offered by bank is 6(1/4)% per annum compounded annually. How much amount should she invest today to achieve her target amount?

A. ₹ 4,37,500
B. ₹ 4,09,600
C. ₹ 46,900
D. ₹ 49,600

Question 42

The sum required to earn a monthly interest of ₹ 1,200 at 18% per annum simple interest is:

A. ₹ 60,000
B. ₹ 50,000
C. ₹ 80,000
D. ₹ 66,000

Question 43

The compound interest on ₹ 40,000 at 12% per annum compounded quarterly for 6 months is:

A. ₹ 2,463
B. ₹2,643
C. ₹ 2,364
D. ₹ 2,436

Question 44

At a certain rate of interest per annum, the difference between the compound interest and simple interest on ₹ 3,00,000 for two years is 480, then the rate of interest per annum is:

A. 4%
B. 2%
C. 6%
D. 8%

Question 45

What is de prof ₹ 1,000 to be received after two you compoundest annually at 10% imerest rate?

A. ₹ 826
B. ₹ 500
C. ₹ 836
D. ₹ 835

Question 46

Mr. x makes a deposit of ₹ 12,000 in a bank where the amount doubles at compound interest in 5 years, then what will be the total amount he will have 46. Mr. X makes a after twenty years?

A. ₹ 1,20,000
B. ₹ 96,000
C. ₹ 1,24,000
D. ₹ 1,92,000

Question 47

Year	2019	2020	2021	2022	2023
EPS	40	25	40	60	90

Calculate the Compounded Annual Growth Rate (CAGR) of EPS.

A. 23.47%
B. 24.47%
C. 22.47%
D. 21.47%

Question 48

In an account paying interest @9% per year compounded monthly, ₹ 200 is invested at the end of each month. What is the future value of this annuity after 10 payment?

{Where $(1.0075)^{10}$ - 1.0775}

A. ₹ 2,066
B. ₹ 1,022
C. ₹ 2,044
D. ₹ 2,155

Question 49

A Perpetuity has a cash flow of f 625 and a required rate of return of 8%. If the cash flow is expected rate of 4% per year, then the ta constant intrinsic value of this perpetuity (presens value of growing perpetuity) is: to grow at a

A. ₹ 13,000
B. ₹ 15,625
C. ₹ 14,250
D. ₹ 16,667

Question 50

What is the annual contribution required by an organization to accumulate ₹20,00,000 in ten years for the construction of a new manufacturing plant, utilizing a sinking fund with an annual interest rate of 6% compounded interest annually?

(Where A (10, 0.06)-13.180785)

A. ₹ 1,67,440.90
B. ₹ 1,51,736.03
C. ₹ 1,75,433.60
D. ₹ 1,83.714.28

Question 51

An investor intends to purchase a three year ₹ 1,000 par value bond having nominal interest rate of 10%. At what price the bond may be purchased now, if it matures at par and the investor requires a rate of return of 14%?

A. ₹ 907.125
B. ₹ 904
C. ₹ 905.25
D. ₹ 909

Question 52

A loan of ₹ 16,550 is to be paid in three equal annual instalments at compound interest. The value of annual instalment, if the rate of interest is 10% per annum is:

A. ₹ 1,243
B. ₹ 6,655
C. ₹ 6,565
D. ₹ 1,343

Question 53

A selection is to be made for one post of Principal and two posts of Vice - Principal. Amongst the six candidates called for the interview, only two are eligible for the post of Principal, while they all six are eligible for the post of Vice-Principal. The number of possible combinations for the selection is:

A. 12
B. 4
C. 18
D. 20

Question 54

A roadside tea stall merchant borrows ₹ 9,000 at 2.76% Simple Interest per annum. The principal and the interest are to be paid in 10 monthly instalments. If each instalment is double than the preceding one, find the value of the last instalment.

A. 4,608
B. 1,024
C. 9,207
D. 4,096

Question 55

In a class of 4 boys and 3 girls, they are required to sit in a row in such a way that no two girls can sit together. Compute in how many different ways they can sit together.

A. 480
B. 60
C. 720
D. 1,440

Question 56

How many total combinations can be formed 1 of 8 different counters marked as 1. 2. 3. 4. 5. 6. 7 & 8, taking 4 counters at a time and there being at least one odd and one even numbered counter in each combination?

A. 66
B. 68
C. 64
D. 62

Question 57

In a party every person shakes hands with every other person. If there are 105 handshakes in total, find the number of persons in the party.

A. 15
B. 14
C. 21
D. 22

Question 58

Let A = {1, 2, 3} and consider the relation R={(1, 1), (2, 2), (3, 3) , (1, 2), (2, 3), (1, 3)}, then R is

A. (A) Reflexive but not symmetric
B. (B) Reflexive but not transitive
C. (C) Symmetric and Transitive
D. (D) Neither symmetric nor transitive

Question 59

If $f(x) = x^2 + x - 1$ and $4f(x) = f(2x)$ then find the value of 'x'

A. 2/3
B. 3/2
C. 3/4
D. 4/3

Question 60

If for an infinite geometric progression, first term is 'a', common ratio is 'r', the sum is 8 and the second term is ‘7/8’, then:

A. a = 4 & r = 7/16
B. a = 3 & r = 7/24
C. a = 7 & r = 1/8

D. a = 2 & r = 7/32

Question 61

The numbers x, 8. y are in G.P. and the numbers x, y, -8 are in A.P. The values of x and y respectively shall be:

A. 4,16
B. 16,4
C. 4,8
D. 8,4

Question 62

If fourth term of A.P. series is zero, then what is the ratio of twenty-fifth term to eleventh term ?

A. 4
B. 5
C. 3
D. 2

Question 63

If $x = t^2$ and $y = t^3$, then $(d^2y)/(dx^2)$ is equal to

A. 3/4t
B. 3t/2
C. 3/2t
D. 3/2

Question 64

dx is equal to:

A. $x \log_e(x/e) + c$
B. $x \log_e(ex) + c$
C. $x \log_e(e/x) + c$
D. $x \log_e(x/e) + c$

Question 65

If a set contain n elements, then the total number of proper subsets of set is:

A. $2^n - 1$
B. 2^n
C. 2^{n-1}
D. 2^{n-2}

Question 66

A town has a total population of 50,000. Out of it 28,000 read the newspaper 'X' and 23,000 read newspaper 'Y', while 4,000 read both the newspapers. The number of persons not reading any of the two newspapers are:

A. 3,000
B. 2,000
C. 2,500
D. 5,000

Question 67

If $x^y \times y^x = 16$ then the value of dy/dx at (2, 2) is:

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

Question 68

Find the odd man out from the following series: 7, 23, 47, 119, 171, 287

A. 171
B. 119
C. 287
D. 7

Question 69

In a certain code, RIPPLE is written as 613382 and LIFE is written as 8192. How is PILLER written in that code?

A. 318286
B. 318826
C. 618826
D. 338816

Question 70

AZ, GT, MN,....., YB, EV. The value at blank (.....) space will be:

A. SH
B. JH
C. SK
D. TS

Question 72

Find the next number in the series 2, 5, 11, 23, 47...

A. 95
B. 84
C. 98
D. 105

Question 73

If TAP is coded as SZO in a language, then how is FRIEND coded in same language?

A. QEDHCM
B. CMDHQE
C. EQIENE
D. EQHDMC

Question 74

One morning after sunrise, A and B were talking to each other face to face very closely at a crossing point. If B's shadow was exactly to the right of A, in which direction B was facing?

A. West
B. East
C. North
D. South

Question 75

In a multi-storey building on one floor there are six flats in two rows facing East and West and they are allotted to A, B, C, D, E, and F. B gets an East facing flat, which is not next to D. F and D gets diagonally opposite flat. A gets a West facing flat and E gets an East facing Whose flat is between A and F?

A. (A) C
B. (B) B
C. (C) D
D. (D) F

Question 76

Balkrishna is Ritik's neighbour and his house is 200 meters away in the north- west direction from Ritik's house. Jayendra is Ritik's neighbour and his house is located 200 meters away in the south-west direction from Ritik's house. Girdhari is Jayendra's neighbour and he stays 200 meters away in the south- east direction from Jayendra's house. Ritik is Girdhari's neighbour

and his house is located 200 meters away in north-east direction from Girdhari's house. Then where is the position of titik's house in relation to Balkrishna's?

A. South-West
B. South-East
C. North
D. North-East

Question 77

If Ajay stands on his head with his face towards North, in which direction will his left hand point?

A. North
B. North-East
C. East
D. North-West

Question 78

If Kiran put her time-piece on the table in such a way that at 6:00 PM, hour hand points to East. In which direction the minute hand will be at 9:30 PM?

A. North-West
B. South-East
C. East
D. West

Question 79

Six persons A, B, C, D, E and F are siting in a row in a straight line. B is between F & D. E is between A & C. A does not sit next to F or D.C does not sit next to D. F is between which of the following person?

A. B & C
B. B & E
C. B & D
D. B & A

Question 80

In a school cultural committee meeting four girls Dipti, Aruna, Chandra, Bindu and four boys Gautam, Faneesh, Harendra, Eshaan are sitting in a circle around a table, facing each other as under:

(i) No two girls or boys are sitting side by side.

(ii) Chandra, who is sitting between Gamam and Eshaan, is facing Dipti.

(iii) Faneesh is between Dipti and Arundland facing Gautam.

(iv) Harendra is to the right of Bindu.

Identify the person whom Eshaan is facing.

A. Bindu
B. Faneesh
C. Gautam
D. Harendra

Note: Read the following information carefully and answer the questions (81 to 82) given below:

Six persons B, D, C, M, J and K are split into groups of three each and are made to stand in two rows in such a way that a person in one row is exactly facing a person in the other row. M is not at the ends of any row and is to the right of J, who is facing C. K is to the left of D who is facing M.

Question 81

Which of the following persons are in the same row?2

A. BMJ
B. BDC
C. MJK
D. MJD

Question 82

Who is to the immediate left of B?

A. J
B. M
C. D
D. K

Question 83

During an interview, seven applicants sitting in tow are awaiting their turn. Chandresh is sitting left to to Kuldeep but on the right to Diksha, Reshma is sitting right to Kuldeep, Priyanka is sitting right to Gayatri but left to Diksha. Himani is sitting left to Gayati. The person sitting in the middle must be:

A. Diksha
B. Chandresh
C. Gayatri
D. Priyanka

Question 84

A is B's Father C is B's mother. D is C's Son bis A's mother. Then how is A related to D?

A. (A) Grandson
B. (B) Uncle
C. (C) Granddaughter
D. (D) Father

Question 85

Pointing to a man in photograph, a woman said "The father of his brother is only son of my grandfather", then how is that woman related to the man in photograph?

A. Sister
B. Daughter
C. Mother
D. Aunty

Question 86

The Secondary data is collected by:,

A. Observation method.
B. International source like World Bank.
C. Interview method.
D. Mailed questionnaire method.

Question 87

Exit polls are an example of which method of collecting data?

A. Investigation
B. Random sampling
C. Census
D. Quota sampling om

Question 88

A family consists of six members P, Q, R, S, T & U. There are two married couples. Q is a doctor and father of T; U is grandfather of R and is a contractor, S is grandmother of T and is a

house-wife. There is one doctor, one contractor, one Professor, one house-wife and two students in the family. Find who is the husband of P.

A. S
B. T
C. R
D. Q

Question 89

P is the son of Q while Q & R are sisters to one another. T is the mother of R. If S is son of T, how S is related to P? Q-R-

A. Cousin
B. Brother
C. Maternal uncle
D. Nephew

Question 90

Sandhya is the daughter-in-law of Shailesh and sister-in-law of Rajan. Manak is son of Shailesh and only brother of Rajan. Then, how Sandhya is related to Manak?

A. Aunty
B. Sister-in-law
C. Cousin
D. Wife

Question 91

The Ogive can be used for making

A. medium term projection
B. short term projection
C. long term projection
D. group frequency distribution

Question 92

Numerical data presented in descriptive form are called:

A. Tabular presentation
B. Classified presentation
C. Textual presentation
D. Graphical presentation

Question 93

The distribution of commuters coming to a Metro station from early morn hours to peak morning hours follows which type of of frequency curve?

A. J-shaped curve
B. Bell shaped curve
C. U-shaped curve
D. Mixed curve

Question 94

What is the range of a de a set?

A. The difference between the mean and median of the data set
B. The difference between the highest and lowest values in the data set
C. The number of data points in the data set
D. The standard deviation of the data set

Question 95

Series in which frequencies are continuously added corresponding to class interval in the series:

A. Cumulative frequency series
B. Frequency
C. Deviation
D. Mid value

Question 96

The mean of a group X is 70 and the mean of group Y is 85. If the number of observations in group Y is five times that of group X, then the combined mean of both the groups is

A. 80
B. 75
C. 77.5
D. 82.5

Question 97

The Median of the following frequency distribution is:

x	0-10	10-20	20-30	30-40	40-50
f(x)	8	30	40	12	10

A. 22.5

B. 33
C. 23
D. 24

Question 98

What type of data is most appropriate presenting using a Pie chart?

A. Categorical data
B. Continuous data
C. Ordinal data
D. Interval data

Question 99

If the class intervals boundaries is data are 10-14, 15-19, 20-24, then the first class

A. 10-14
B. 9.5-14.5
C. 10-15
D. 10.5-15.5

Question 100

What is the purpose of stratified random sampling?

A. To divide the population into subgroups and then randomly sample from each subgroup
B. To ensure that every individual in the population has an equal chance of being selected
C. To select individuals based on their availability and convenience.
D. To select a fixed percentage of the population without any specific criteria.

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JAN 2025

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CA FOUN I Math I 18JAN25 (Ques with ans)

1. U is father of W, X is son of V, Y is brother of U. If W is sister of X, how is X related to Y?
(A) Father
(B) Sister-in-law
(C) Nephew
(D) Grandson

2. Standard Error (SE) and square root of sample size are
(A) Directly proportional
(B) Equal
(C) Inversely proportional
(D) Not equal

3. The mean of three numbers is 135. Among the three numbers the biggest number is 180. The difference between the remaining two numbers is 25. Then the smallest number is
(A) 130
(B) 125
(C) 120
(D) 100

4. B is daughter of A. C is brother of B. C is the only son of D. C and E are married couple. F is the only son of E. Then how is F related to A?
(A) Grandson
(B) Father
(C) Brother
(D) Uncle

5. Given that X is mother of Y. Z is son of X. A is brother of B. B is daughter of Y. Who is grandmother of A?
(A) X
(B) Y
(C) A
(D) B

6. Which sampling technique is most appropriate when a person wants to ensure that subgroups are proportionally represented?
(A) Stratified Sampling
(B) Simple Random Sampling
(C) Multistage Sampling
(D) Systematic Sampling

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7. For the non-overlapping classes 25-34, 35-44, 45-54, 55-64 the class mark of the class 35-44 is
(A) 39.5
(B) 40.5
(C) 35.0
(D) 44.0

8. Non-probability Sampling is also known as:
(A) Stratified Sampling
(B) Simple Random Sampling
(C) Purposive or Judgment Sampling
(D) Cluster Sampling

9. Out of 1000 persons, 40% are female, others are male. In a marriage function, 300 persons enjoyed the song. 30% of the people who had not enjoyed the song were female. What is the number of male who did not enjoy the song in the function?
(A) 120
(B) 180
(C) 360
(D) 490

10. In tabular presentation of data, stub is
(A) Left part of table, which provide the description of rows
(B) Right part of the table providing the description of the row
(C) Left part of the table providing the description of columns
(D) Right part of the table providing the description of columns

11. Mean deviation is when the deviations are taken from the median.
(A) maximum
(B) minimum
(C) zero
(D) can't say

12. If x and y are related as 4x + 2y + 120 and mean deviation of x is 4.5, then the mean deviation of y is
(A) -9
(B) 9
(C) 1.1
(D) 4.5

13. For a distribution the mean is 30. The standard deviation is 2, then coefficient of variation is
(A) 6.67%
(B) 9.45%
(C) 7.5%
(D) 2.5%

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14. Ogive is used to find
(A) Mean
(B) Median
(C) Mode
(D) Range

15. The algebraic sum of deviation of set of observations from their arithmetic mean is
(A) $\frac{\Sigma Xi}{n}$
(B) $\sqrt{\frac{\Sigma(xi-\bar{x})\text{^}2}{(n-1)}}$
(C) $\frac{\Sigma Xi}{(n-1)}$
(D) Zero

16. Find the Harmonic Mean of 2, 4 & 6.
(A) 3.30
(B) 3.00
(C) 3.75
(D) 4.00

17. If the mode of the following data is 13, then the value of x in the 13, 8, 6, 3, 8, 13, 2x + 3, 8, 13, 3, 5, 7
(A) 6
(B) 5
(C) 7
(D) 8

18. The best measure of central tendency is
(A) Mean
(B) Median
(C) Mode
(D) Range

19. A sample of 100 people is taken from a population of 1000. The sample mean height is 170 cm with a standard deviation of 10 cm. What is the standard error of mean?
(A) 0.5 cm
(B) 1.0 cm
(C) 1.58 cm
(D) 10 cm

20. In pie chart, if a category represents 25% of the total data, what will be the angle of corresponding sector?
(A) 90°
(B) 45°
(C) 60°

(D) 75°

21. Let A and B be two possible outcomes of a random experiment and P(A) = 1/3 and and P(A U B)= 1/2 , P(B) = x For what value of x are A and B mutually exclusive events?
(A) 1/4
(B) 1/6
(C) 1/5
(D) 1/8

22. A random variable X has the following probability density function: $f(x) = 6x(1 - x), 0 \leq x \leq 1$.
Then the mean is:
(A) 1/12
(B) 1/3
(C) 1/4
(D) 1/2

23. The standard deviation of the data 2, 4, 5, 6, 8, 17 is 23.33, then the standard deviation of the data 4, 8, 10, 12, 16, 34' is
(A) 23.33
(B) 46.66
(C) 12.23
(D) 0

24. The values of the first quartile and third quartile are 36.50 and 57.50. Then the semi-inter-quartile range is
(A) 47.50
(B) 12.50
(C) 10.50
(D) 11.50

25. The AM & GM for two observations are 8 and 2. Find the values of two observations.
(A) 15.75, 0.25
(C) 15,1
(B) 16, 1
(D) 14.75, 1.75

26. A random variable has the following probability distribution:

X:	P:
0	1/2
1	1/3
2	1/4
3	1/5

Find expected value of X.

(A) 1.43
(B) 1.20
(C) 1.80
(D) 2.00

27. What will be the mode of the Binomial distribution in which mean is 20 & Standard Deviation is $\sqrt{10}$.
(A) 20.5
(B) 21
(C) 20
(D) 41

28. If X is a Poisson variable such that P(X = 1) = P(X = 2) then the variance is
(A) 2
(B) 1
(C) $\sqrt{2}$
(D) 3

29. Which one of the following statement is wrong?
(A) The normal curve is bell shaped.
(B) The correlation coefficient between X and Y is 2.6.
(C) If r = 0 regression lines are perpendicular to each other.
(D) For any two events A and B, P(A U B)= P(A) + P(B) -P(A ∩ B)

30. Let P(A) = 1/5 and P(*B′*) = 3/. If A and B are mutually exclusive events then P(AUB) :
(A) 1/5
(B) 3/5
(C) 2/5
(D) 4/5

31. The mean deviation of normal distribution is approximately equal to
(A) 0.5 σ
(B) 3.14 σ
(C) 1.14 σ
(D) 0.8 σ

32. You are given the following data relating to a frequency distribution of 10 observations:
ΣX = 50, ΣY = 60, then Cov(X, Y) is ΣX^2 = 300, Σ Y^2 = 352, Σ(X + Y)^2 = 1372
(A) 2
(B) 4
(C) 6
(D) 8

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33. If 3 percent of ceramic cup manufactured by a company are known to be defective. What is the probability that a sample of 100 cups are taken from the production process, of that company would contain exactly one defective cup?
(A) 0.15
(B) 0.03
(C) 0.09
(D) 0.30

34. A population comprises 7 members. The number of all possible samples of size 3 that can be drawn from it with replacement is -
(A) 216
(B) 343
(C) 21
(D) 125

35. Compute the rank correlation coefficient from the following data:
n = 10, $\sum d^2 = 5$
(A) 0.95
(B) 0.97
(C) 0.96
(D) 0.99

36. If r = 0.8, byx =0.6, bxy =0.5, $\bar{x} = 5$ and $\bar{y} = 3$, then the regression equation y on x is
(A) y = 0.6x - 6
(B) y = 0.96x - 3.7
(C) y = 0.8x
(D) y = 0.6x

37. Which one of the following index uses the method of average of base year and current year?
(A) Laspeyre's Index
(B) Paasche's Index
(C) Marshall-Edgeworth Index
(D) Fisher's Index

38. If r = 0.8 then coefficient of non - determination is
(A) 0.36
(B) 0.64
(C) 0.20
(D) -0.36

39. The correlation coefficient between X and Y is 0.2 and Var(X) = 5Var(Y) then regression coefficient of X on Y is
(A) 1/5
(B) $\sqrt{5}$

(C) $1/\sqrt{5}$
(D) 5

40. If Laspeyre's index number is 125 and Paasche's index number is 500 then Fisher's index number is
(A) 312.5
(B) 250.0
(C) 62.5
(D) 147.5

41. When the cost of Beverages increased by 40%, the person said that the rise had increased his cost of living by 8%. Before the change in price, the percentage of his cost of living was due to buying Beverages is:
(A) 15%
(B) 20%
(C) 5%
(D) 2%

42. If the prices of all the goods change in the same ratio, then
(A) Laspeyre's index and Paasche's index numbers are equal.
(B) Laspeyre's index and Paasche's index numbers are not equal.
(C) Laspeyre's index is greater than Paasche's index number.
(D) Laspeyre's index is less than Paasche's index number.

43. Given that $\Sigma PnQn$ = 300, ΣPoQo = 125 and Paasche's index number is 200, then the value of ΣPoQn is :
(A) 125
(B) 150
(C) 250
(D) 100

44. $(\frac{x}{y})^{a2+4} = (x^{-1}y)^{-5a}$ then the value of a is
(A) -4,1
(B) 4,-1
(C) -4,-1
(D) 4,1

45.If x = $\sqrt{2} + \frac{1}{\sqrt{2}}$ and y= $\sqrt{2} - \frac{1}{\sqrt{2}}$, then $(x^2 + y^2)$ is
(A) $\sqrt{2}$
(B) $1/\sqrt{2}$
(C) 5
(D) 0

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46. Suppose a father had a sum of 3,600 and he decided to divide this amount among his three sons Anil, Sunil and Nimal in such a way that 3 times Anil's share, 6 times Sunil's share, and 8 times Nimal's share are all equal. Then Anil's share is
(A) ₹1,920
(B) ₹960
(C) ₹720
(D) ₹1,860

47. The ratio of age of two sisters is 5: 7. One is elder to the other by 8 years. Then the ratio of their age after 4 years between older to younger is
(A) 2:5
(B) 4:3
(C) 4:5
(D) 3:5

48. What are the values of x & y from the given equations?
Given that $\frac{X}{2} - \frac{Y}{5} = y - x$ and $\frac{(x-5)}{(y-10)} = 1$
(A) (15,20)
(B) (20, 25)
(C) (25,30)
(D) (30,35)

49. A company produce two type of product A & B which require processing in two machines. First machine can be used up to 15 hrs. and second can be used at most 12 hrs. in a day. The product A requires 2 hrs. on machine 1 & 3 hrs. on machine 2. The product B requires 3 hrs. on machine 1 & 1 hour on machine 2. This can be expressed as:
(A) 2x{1} + 3x{2}≤ 15 ; 3x{1} + x{2}≤ 12
(B) 2x{1} + 3x{2}≤ 15 ; 3x{1} + x{2}≤ 15
(C) 3x{1} + 2x{2}≤ 15; 2x{1} + x{2}≤ 12
(D) 2x{1} + 3x{2}≤ 12; 3x{1} + x{2}≤ 15

50. If a and ß are roots of the equation 2x^2 - 4x + 6 = 0 then the quadratic equation with roots /β and β2/ α2

(A) $3x^2$ - 10x + 9 = 0
(B) $3x^2$ + 10x + 9 = 0
(C) x^2 - 13x + 3 = 0
(D) x^2+ 10x + 9 = 0

51. A manufacturer produces two products A and B. The profit on product A is 8 on each unit and profit on product B 13 on each unit. Then the objective function is
(A) Minimize Z = 8x{1} + 13x{2}
(B) Maximize Z = 8x{1} + 13x{1}
(C) Minimize Z = 13x{1} + 8x{2}
(D) Maximize Z = 13x{1} + 8x{2}

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52. A certain amount at a rate of simple interest x, doubles in 5 years. At another rate of simple interest y, it becomes three times in 8 years. Then the difference between these two interest rates is
(A) 5 %
(B) 8%
(C) 3%
(D) 4%

53. Anil deposited a certain amount in a bank at the rate of 10% per annum compounded semi-annually. At the end of one year Anil received a sum of 13.230. Then the sum deposited in the bank is
(A) ₹13,000
(B) ₹1,200
(C) ₹12,000
(D) ₹5,000

54. The simplified value of $[5a^2\ b^2$ x 3$(ab^3$)^2] / $(15a^2\ b)$ is
(A) $a^5\ b^7$
(B) $a^7\ b^7$
(C) $a^5\ b^5$
(D) $a^7\ b^5$

55. Three Employees A, B and C of a firm receive variable incentive money in the ratio 3: 4: 5. Then the Management also gave a fixed incentive of 4,000 to each of them. As a result now the total incentive amount of A, B and C becomes in the ratio 5 6 7. How much amount did B get as a variable incentive?
(A) ₹2,000
(B) ₹4,000
(C) ₹6,000
(D) ₹8,000

56. The future value of an annuity of 7 7,200 made annually for 5 years at the rate of 12% compounded annually is (Given that (1.12)5 = 1.76234)
(A) ₹45,740.40
(B) ₹4,574.50
(C) ₹54,740.50
(D) 2,400.50

57. John borrows a loan of₹ 10,000 from a bank and he agreed to pay back in 24 equal instalments at the rate of 10% compound interest per annum. Then each instalment amount is (Given that (1.1)24 = 9.84973)
(A) ₹1,200.35
(B) 1,112.99
(C) 1,211.99
(D) 1,321.56

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58. What is the present value of 8,000 to be required after 10 years if the interest rate be 6%? (Given that (1.06)10 = 1.7908)
(A) 6,499.87
(B) 4,467.28
(C) 5,867.32
(D) 1,790.86

59. The effective rate of interest corresponding to a nominal rate of 8% per annum payable quarterly is (Given that (1.02)4 = 1.08243216)
(A) 6.24%
(B) 5.38%
(C) 8.24%
(D) 82.4%

60. Sunil plans to save for his higher studies. He wants to accumulate a sum of *5,00,000 at the end of 10 years. How much amount should he invest every year if the interest rate is 10% compounded annually? (Given that (1.1)10 = 2.593742)
(A) 31,372.71
(B) ₹3,137.27
(C) 31,312.71
(D) 3,000.32

61. 1,500 is paid every year for 10 years to pay a loan. What is the loan amount, if rate of interest 5% p.a? If (1.05) 10 = 1.6288
(A) 11,581.53
(B) 11,505.50
(C) 11,903.38
(D) 12,503.48

62. A certain amount is invested in a bank. What annual rate of interest compounded annually becomes 8 times of this investment in 5 years?
(Given that 81/5 = 1.515716)
(A) 51.57%
(B) 5.15%
(C) 15.15%
(D) 1.51%

63. If the compound interest on a certain sum for 2 years at 5% per annum is 246, then the simple interest on the same sum for double the time and double the rate per annum is:
(A) ₹900
(B) ₹960
(C) ₹1,000
(D) ₹1,100

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(Ques with ans)

64. Sam invested 12,000 for 10 years in a financial company. At the end of 10th year his investment value is 18,000. Then the Compound Annual Growth Rate (CAGR) is if (x) 1/n = 1.0413
(A) 41.40%
(B) 4.13%
(C) 11.56%
(D) 12.06%

65. Mr. A invested 20,000 in a bank at the rate of 4.5% p.a. He received 27,500 after the end of term. Find out the period?
(A) 4.50 Yrs
(B) 8.34 Yrs
(C) 6.50 Yrs
(D) 8.10 Yrs

66. Assuming that the discount rate is 12% per annum, how much would you pay to receive 100, growing at 8% annually forever?
(A) ₹2,500
(B) ₹2,700
(C) ₹3,000
(D) ₹2,000

67. In how many ways can 5 Doctors, 4 Professors, and 6 Auditors be seated in a row so that all person of the same profession sit together?
(A) 3!5!
(B) 3!5!4!
(C) 3!5!4!6!
(D) 3!5!6!

68. The sum of the 4th and 8th term of an AP is 10. Then the sum of first eleven terms of the series is
(A) 33
(C) 44
(B) 22
(D) 55

69. Madhu deposits 100 in a Bank at the beginning of every year for 20 years at 10% interest rate compounded annually, how much would she earn after 20 years? [Given that (1.1) ^ 20 = 6.7275]
(A) ₹ 6,300.25
(B) ₹ 6,500.45
(C) ₹5,600.25
(D) ₹ 6,250.35

70. How much amount is required to be invested every year so as to accumulate 15,00,000 at the end of 20 years if interest is compounded annually at 10%? [Given A(n, i) = 57.274999]
(A) ₹ 26.189.44
(B) ₹29,190.35

(C) ₹24.155.35
(D) ₹30.698.44

71. In how many ways can 13 balls be arranged, if 4 of them are black, 6 red & 5 are white?
(A) 3004
(B) 3005
(C) 3003
(D) 3008

72. Find the 9th term of the A.P. 8, 5, 2, -1, -4,
(A) -10
(B) -24
(C) -16
(D) -4

73. The sum of series 142+3+ is 55. The number of terms is:
(A) 40
(B) 30
(C) 20
(D) 10

74. A panel has a total of 11 members including 5 males and 6 females. Find out the number of ways of picking 2 males and 3 females from the given panel team.
(A) 110
(B) 200
(C) 220
(D) 350

75. The product of three numbers which are in GP is 512. Then the second number is
(A) 2
(B) 3
(C) 6
(D) 8

76. Let A = {a, b, c, d, e) then the number of proper subsets is
(A) 31
(B) 32
(C) 30
(D) 29

77. If x = at^2 and y = a(t^3 - t) then dy/dx=
(A) ($3t^2$ - 1)/(2t)
(B) ($3t^2$ - t)/(2t)
(C) ($3t^2$ - 1)/t
(D) ($3t^2$ + 1)/(2t)

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78. The marginal revenue function for a product MR = 5 - 4x + $3x^2$. Then the total revenue function is
(A) 5x + $2x^2$ + x^3
(C) 5x + $2x^2$ + x^3+ 3
(B) 5x - $2x^2$ + x^3
(D) 5x - $2x^2$ - x^3

79. Evaluate: lim x→ 3 (x^2 + 4x + 3)/(x^2+ 6x + 9)
(A) 2/3
(B) 2/8
(C) 2
(D) 1/3

80. In how many ways can an interview panel of 3 members be formed from 3 engineers, 2 psychologists and 3 managers if at least 1 engineer must be included?
(A) 30
(B) 15
(C) 46
(D) 45

81. A = {a, b, p} B = {2, 3} C = {p, q, r, s} then n[(AUC)*B] is:
(A) 8
(B) 20
(C) 12
(D) 16

82. Find the missing term CEGI, XVTR, GIKM,
(A) TRPN
(C) AMNL
(B) KMBD
(D) JLNP

83. In certain code language 'CLOCK' is coded as 75276 and 'EARTH' is coded as 83491, then 'COAT' is coded as
(A) 7329
(B) 7239
(C) 7932
(D) 7529

84. Find the missing term of series 2. 1, 76, 29,__,67,92
(A) 39
(B) 46
(C) 43
(D) 62

85. $\int (2x + 5)^7 dx$
(A) $(2x + 5)^8/16$
(B) $(2x + 5)^7/7$
(C) $(2x^2+5x^7)/2$
(D) $(2x^2+5x^7)/5$

86. A committee of 3 members is formed from 5 women and 3 men in such a way that it consists at least 2 members who are women. In how many different ways can it be done?
(A) 40
(B) 50
(C) 60
(D) 30

87. Anil started walking 5 kms towards north then he turned left and walked 3 kms. Again he turned left and walked 5 kms. Then the total number of kms he walked is
(A) 13 kms
(C) 3 kms
(B) 8 kms
(D) 5 kms

88. Raju started walking 10 kms towards east from his home. He turned right and walked 5 kms to the south to reach his school. In which direction is his school from his home?
(A) South-East
(B) North-East
(C) South-West
(D) North-West

89. A started walking from his house & walk 4 km north side then turns right & walk 3 km. If he turns right again, what is the direction now?
(A) North
(B) West
(C) East
(D) South

90. In a certain language 'MENTION' is written as 'NFOUJPO', the code of 'MYSTIFY' is:
(A) NZTUJGZ
(C) LNEITNO
(B) NFOFTJT
(D) OERESTN

91. Find the odd man out from the following: Marriage, Wedlock, Divorce, Matrimony
(A) Marriage
(B) Wedlock
(C) Divorce

(D) Matrimony

92. Eight persons A, B, C, D, E, F, G and H are sitting in two rows opposile each other. Each row has 4 persons. B and C are sitting opposite side. C is sitting in between E and D. H is sitting immediate left of E. F and Hare sitting at diagonally opposite position. G is sitting extreme left. Who is sitting in front of E?
(A) F
(B) G
(C) B
(D) A

93. Five persons A, B, C, D and E are sitting in a circle facing centre. C is sitting immediate left of E. A is sitting in between E and D. Who is sitting between B and A?
(A) C
(B) D
(C) E
(D) B

94. A man starts walking 10 km to the North. He turns right and walks 5 km, then turns right again and walks 10 km. In which direction is man now from the starting point?
(A) East
(B) West
(C) North
(D) South

95. In the morning Anika started walking from a point where her shadow falls in front of her. She walked 2 kms and then turned left and walked 2 kms. Again she turned left and walked 2 kms. In which direction is she now facing?
(A) East
(B) West
(C) South
(D) North

96. Five persons A, B, C, D & E sitting on a bench. A is immediate right of B. E is immediate left of C and immediate right of A. B is the right of D. Which person is sitting in the middle of bench?
(A) B
(B) E
(C) A
(D) D

97. L is the wife of N, P is son of N, K is brother of N and father of O. What is the relationship between P and O?
(A) Uncle
(B) Brother
(C) Cousin

(D) Nephew

98. C is the sister of B. D is the father of A. A is the brother of B. D and E are a married couple. How is C related to E?
(A) Daughter
(B) Son
(C) Mother
(D) Father

99. Five people A, B, C, D, E are seated about a round table facing outside the center but not necessary in the same order. A sits at the immediate right of E. C sits third to the left of D, who sits at the immediate right of A. How many persons are sitting between C & D?
(A) 1
(C) 3
(B) 2
(D) 4

100. Five friends A, B, C, D and E are sitting in a row facing east. A is sitting between C & D. B is second to the left of C. Who is sitting at the south end?
(A) E
(B) B
(C) C
(D) D

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MAY 2025

PAPER – 3: QUANTITATIVE APTITUDE

All Question are compulsory.

Time: 2 Hours **Marks: 100**

1. A startup business was initiated by an entrepreneur by investing ₹ 1,40,000. His friend joined him after six months with an amount of ₹ 2,10,000. Thereafter an angel investor joined them with ₹ 2,80,000 after another six months. What should be the ratio of distribution of total earnings, three years since beginning of business among entrepreneur, his friend and angel investor?

   (A) 7:6:10

   (B) 12:15:16

   (C) 42:45:56

   (D) 2:3:4

2. The sum of three numbers is 98. If the ratio of the first to second number is 2 : 3 and that of the second to third is 5: 8, then the second number is

   (A) 20

   (B) 30

   (C) 48

   (D) 58

3. If $\log \frac{a+b}{4} = \frac{1}{2}(\log a + \log b)$, then the value of $\frac{a}{b} + \frac{b}{a}$ will be

   (A) 12

   (B) 14

   (C) 16

   (D) 8

4. If $4^x = 5^y = 20^z$ then z is equal to

   (A) xy

   (B) $\frac{(x+y)}{xy}$

   (C) $\frac{1}{xy}$

   (D) $\frac{xy}{(x+y)}$

5. If ₹ 58 is divided among 150 children such that each girl and each boy gets 25 p and 50 p respectively. Then how many girls are there?

   (A) 52

   (B) 54

   (C) 68

   (D) 62

6. Puru gets on the elevator at the 11th floor of a building and rides up at the rate of 57 floors per minute. At the same time, Ishu gets on an elevator at the 51" floor of the same building and rides down at the rate of 63 floors per minute. If they continue travelling at these rates, then at which floor will their paths cross?

   (A) 17

   (B) 19

   (C) 27

   (D) 30

7. The quadratic equation $2x^2 - \sqrt{5}\,x + 1 = 0$ has

   (A) Two distinct real roots

   (B) Two equal real roots

   (C) No real roots

(D) More than two real roots

8. For equation $x^3 - 6x^2 + 5x + 12 = 0$, the product of two roots is 12. Which of the following is correct set of roots of the equation?

(A) 1, -3, -4

(B) 1, 6, 2

(C) -1, 3, 4

(D) -1, -6, -2

9. On solving the inequalities $6x + y \geq 18$, $x + 4y \geq 12$, $2x + y \geq 10$; which of the following are correct solutions?

(A) (0, 18), (12, 0), (4, 2) and (2, 6)

(B) (3,0), (0, 3), (4, 2) and (7, 6)

(C) (5,0), (0, 10), (2, 4) and (2, 6)

(D) (0, 18), (12, 0), (4, 2) and (0, 7)

10. The longest side of a triangle is 2 times the shortest side and the third side is 4 cm shorter than the longest side. If the perimeter of the triangle is at least 61 cm, find the minimum length of the shortest side.

(A) 7 cm

(B) 9 cm

(C) 11 cm

(D) 13 cm

11. A sum of ₹ 725 is lent in the beginning of a year at a certain rate of simple interest. After 8 months, a sum of ₹ 362.50 more is lent but at the rate twice the former. At the end of the year, ₹ 33.50 is earned as interest from both the loans. What was the original rate of interest?

(A) 3.6%

(B) 4.54%

(C) 3.46%

(D) 4.12%

12. There is 60% increase in amount in 6 years at simple interest. What will be the compound interest of ₹ 12,000 after three years at the same rate?

(A) ₹ 2,160

(B) ₹ 3,120

(C) ₹ 3,972

(D) ₹ 6,240

13. The effective annual rate of interest corresponding to a nominal rate of 6% per annum payable half-yearly is

(A) 6.06%

(B) 6.07%

(C) 6.08%

(D) 6.09%

14. The compound interest on a certain sum for 2 years at 10% per annum is ₹ 525. The simple interest on the same sum for double the time at half the rate percent per annum is -

(A) ₹ 400

(B) ₹ 500

(C) ₹ 600

(D) ₹ 800

15. Find the future value of an investment of ₹ 7,000 compounded quarterly at 10% per annum for 3 years. [Given that $(1.025)^{12} = 1.34489$]

(A) ₹ 9,414.20

(B) ₹ 7,435.73

(C) ₹ 7,941.42

(D) ₹ 8,000.00

SUGGESTED ANSWER

FOUNDATION EXAMINATION: MAY 2025

16. Raju will pay instalments of ₹ 3,150 per month for the next 3 years towards his loan at an interest rate 12.4%, discounted monthly, what was the approximate amount of loan taken initially?

[Given that $(1.01033)^{36} = 1.448$]

(A) ₹ 13,683.60

(B) ₹ 9,742.29

(C) ₹ 94,345.17

(D) ₹ 74,158.24

17. Shiv deposits ₹ 10,000 annually in a bank for 5 years, at 10 percent annual compounding interest rate. Calculate the approximate value of this series of deposits at the end of five years, if each deposit occurs at the beginning of the year.

(A) ₹ 61,050

(B) ₹ 67,156

(C) ₹ 71,050

(D) ₹ 77,160

18. If you deposit ₹ 4,000 into an account paying 6% annual interest compounded quarterly, how much approximate money will be in the account after 5 years?

[Given that $(1.015)^{20} = 1.34489$]

(A) ₹ 3387.42

(B) ₹ 4387.42

(C) ₹ 5387.42

(D) ₹ 6387.42

19. Relationship between annual nominal rate of interest and annual effective rate of interest, if frequency of compounding is greater than one

(A) Effective rate < Nominal rate

(B) Effective rate > Nominal rate

(C) Effective rate = Nominal rate

(D) Effective rate = 0.9 times Nominal rate

20. Madhu invests ₹ 15,000 in a scheme and at the time of maturity the amount became₹ 25,000. If CAGR for this investment is 8.88%, calculate the approximate number of years for which she has invested the amount.

[Given that log (1.667) = 0.2219 and log (1.089) = 0.037]

(A) 6 years

(B) 7.7 years

(C) 5.5 years

(D) 7 years

21. How much approximate amount should you save annually to accumulate ₹ 20,00,000 by the end of 12 years, if the saving earns an interest of 14 percent compound annually?

[Given that $(1.14)^{12} = 4.8179$]

(A) ₹ 4,15,118

(B) ₹ 5,23,848

(C) ₹ 73,339

(D) ₹ 1,11,200

22. Dinesh received a cash bonus of ₹ 1,00,000 which he deposited in a bank which pays 10 percent interest compounded annually. How much approximate equal amount can Dinesh withdraw annually for a period of 10 years?

[Given that $(1.1)^{10} = 2.59374$]

(A) ₹ 16,273

(B) ₹ 38,554

(C) ₹ 62,745

(D) ₹ 32,474

23. Find the approximate future value of an annuity due of 500 per quarter for 8 years and 9 months at the interest rate of 6% compounded quarterly.

[Given that $(1.015)^{35} = 1.6839$]

(A) ₹ 13,740.86

(B) ₹ 29,428.23

(C) ₹ 56,971.95

(D) ₹ 22,796.66

24. A project is expected to provide cash inflows as follows for 3 years:

Year	1	2	3
Cash Inflows (₹):	40,000	50,000	30,000

The company's cost of capital or required rate of return is 15%. What is the present value of cash inflows of the company?

(A) ₹ 99,240

(B) ₹ 1,02,840

(C) ₹ 1,12,640

(D) ₹ 92,315

25. In how many of distinct permutations of the letters in "MISSISSIPPI" when four I's do not come together?

(A) 34650

(B) 40320

(C) 840

(D) 33810

26. Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?

(A) 210

(B) 1050

(C) 25200

(D) 21400

27. Seema, Bharati, Priyanka, Khusboo and Lalita are 5 speakers. The number of ways in which Seema will always speak before Bharati shall be -

(A) 24

(B) 4! x 2!

(C) 5!

(D) 12

28. A team of 3 persons is to be constituted from a group of 2 men and 3 women. In how many ways can this be done if these teams would consist of 1 man and 2 women?

(A) 10

(C) 16

(B) 6

(D) 8

29. Find the sum of n terms of the A.P., whose n^{th} term is 5n + 1

(A) $\frac{n}{2}$

(B) $\frac{2n}{7}$

(C) $\frac{n(7+5n)}{2}$

(D) $\frac{n(7+4n)}{2}$

30. The sum of first three terms of a G.P. is $\frac{21}{2}$ and their product is 27. Which of the following is not a term of the G.P., if the numbers are positive?

(A) 3

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

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

(D) 6

31. Insert 4 numbers between 2 and 22 such that the resulting sequence is an Arithmetic Progression (A.P.).

(A) 4, 8, 12, 16

(B) 5, 9, 13, 17

(C) 4, 10, 15, 19

(D) 6, 10, 14, 18

32. Find the sum of series $1+\frac{1}{2}+\frac{1}{4}+\ldots\ldots$ upto 6 terms.

(A) $\frac{63}{32}$

(B) $\frac{32}{63}$

(C) $\frac{26}{53}$

(D) $\frac{53}{26}$

33. Which of the following relations is transitive but not reflexive for the set S = {3, 4, 6}?

(A) R = {(3, 4), (4, 6), (3, 6)}

(B) R = {(1, 2), (1, 3), (1, 4)}

(C) R = {(3, 3), (4, 4), (6, 6)}

(D) R = {(3, 4), (4, 3)}

34. If A = {1, 2, 3, 4}, B = {2, 4, 6, 8} and C = {3, 4, 5, 6} the value of A – {B ∪ C} is -

(A) {1, 2, 3}

(B) {2, 3, 4, 5}

(C) {1}

(D) {0}

35. The range of the function f(x) = 3x - 2 is

(A) $(-\infty, \infty)$

(B) R - {3}

(C) $(-\infty, 0)$

(D) $(0, -\infty)$

36. Find the value of $\lim_{x \to 4} \frac{\left(x^2 - 2x - 8\right)}{\left(x - 4\right)}$

(A) 0

(B) 2

(C) 8

(D) 6

37. Evaluate: $\int_2^4 (3x - 2)^2 \, dx$

(A) 104

(C) 10

(B) 100

(D) 52

38. Determine f(x), given that f' (x) = $12x^2$ - 4x and f(- 3) = 17

(A) f(x) = $4x^3$ - $2x^2$ + 143

(B) f(x) = $6x^2$- x^4+ 137

(C) $f(x) = 3x^4 - x^3 - 137$

(D) $f(x) = 4x^3 - 2x^2 - 143$

39. Find $\frac{dy}{dx}$ where $\frac{e^t + e^{-t}}{2}$ and $\frac{e^t - e^{-t}}{2}$

(A) $\frac{y}{x}$

(B) $\frac{x}{y}$

(C) $\frac{e^t}{e^{-t}}$

(D) $\frac{1}{e^t}$

40. What is the differential function of $\sqrt{(x^2+2)}$?

(A) $x\sqrt{(x^2+2)dx}$

(B) $\frac{x}{\sqrt{x^2+2}}dx$

(C) $\frac{x}{\sqrt{x^2-2}}dx$

(D) $-\frac{x}{\sqrt{x^2+2}}dx$

41. Identify the next number in the following series: 2, 8, 26, 62, 122, 212, _____

(A) 332

(B) 338

(C) 356

(D) 362

42. Find the missing number in the given series: 4, 18 _____, 100, 180, 294, 448

(A) 48

(B) 52

(C) 56

(D) 64

43. Find the odd man out from the following:

445, 221, 109, 46, 25, 11, 4

(A) 25

(B) 46

(C) 109

(D) 221

44. In a certain code "CH4IR" is written as "GL8MV". How is "1N5T4GR4M" is written in that code?

(A) 4HFID8E8N

(B) 4P8W7JU8O

(C) 5R9X8KV8Q

(D) 5KF2E4GR4

45. A certain code "564" means "all the best", "736" means "best of luck" and "423" means "all is luck". Which of the following is the code for "luck"?

(A) 6

(B) 4

(C) 3

(D) 7

46. A man is facing North-West. He turns 90° in the clockwise direction, then 180° in the anticlockwise direction and then another 90° in the same direction. Which direction is he facing now?

(A) South

(B) South-West

(C) South-East

(D) East

47. Rajni walked 20 m towards the North. Then she turned right and walks 30 m. Then she turns right and walks 35 m. Then she turns left and walks 15 m. Finally she turns left and walks 15 m. In which direction and how many meters is she from the starting position?

(A) 15 m West

(B) 30 m East

(C) 30 m West

(D) 45 m East

48. At a crossing, there was a direction pole, which was showing all the four correct directions. But due to the wind, it turns in such a manner that now West pointer is showing South. Harish went in the wrong direction thinking that he was travelling East. In which direction he was actually travelling?

(A) South

(B) North

(C) West

(D) East

49. Two cars start from the opposite places on a highway, 150 km apart. First car runs for 25 km and takes a right turn and then runs 15 km. It then turns left and then runs for another 25 km and then takes the direction back to reach the main road. In the meantime, due to minor break down the other car has run only 35 km along the main road. What would be the distance between two cars at this point?

(A) 65 km.

(B) 75 km.

(C) 80 km.

(D) 85 km.

50. Some boys are sitting in three rows all facing North such that A is in the middle row. P is just to the right of A but in the same row. Q is just behind of P, while R is in the North of A. In which direction of R is Q?

(A) South

(B) South-West

(C) North-East

(D) South-East

51. Seven persons namely H, I, J, K, M, N, O are sitting in a straight line facing North direction. Total three number of persons are sitting between H and N. Both N and H sits at extreme sides. Total two number of persons sit between H and O. M is not an immediate neighbour of H or N. I sits third to the right of M. I and H both are not an immediate neighbours. M is also not an immediate neighbour of J. Who is sitting between H and M?

(A) J

(B) O

(C) I

(D) K

52. A, B, C, D and E are sitting on a bench. A is sitting next to B, C is sitting next to D, D is not sitting with E who is on the left end of the bench. C is on the second position from the right. A is to the right of B and E. A and C are sitting together. In what position A is sitting?

(A) Between B and D

(B) Between B and C

(C) Between E and D

(D) Between C and E

53. In a class, there are seven students (including boys and girls) A, B, C, D, E, F and G. They sit on three benches I, II and III, such that at least two students on each bench and at least one girl on each bench. C who is a girl student, does not sit with A, E and D. F the boy student sits with only B. A sits on the bench I with his best friends. G sits on the bench III. E is the brother of C. Which of the following is the group of girls?

(A) BCG

(B) BFC

(C) BCD

(D) CDF

54. Five boys A, B, C, D and E are sitting in a row. A is to the right of B and E is to the left of B but to the right of C. A is to the left of D. Who is second from the left end?

(A) D

(B) A

(C) B

(D) E

55. Six friends P, Q, R, S, T and U are sitting around the hexagonal table each at one corner and are facing the centre of the hexagonal. P is second to the left of U. Q is neighbour of R and S. T is second to the left of S. Which one is sitting opposite to P?

(A) R

(B) Q

(C) T

(D) S

56. If "A # B" means A is father of B, "A*B" means A is brother of B, "A @ B" means A is mother of B, then which of the following is correct about G@T#P?

(A) G is mother of P.

(B) P is father of T.

(C) T is son of G.

(D) P is brother of T.

57. Pointing to a photograph, Rajesh said, "He is Aarav and he is the son of the only daughter of the father of my brother", how Rajesh is related to the Aarav referred in the photograph?

(A) Nephew

(B) Brother

(C) Father

(D) Maternal Uncle

58. Study the following information carefully:

- A3P means A is the mother of P.
- A4P means A is the brother of P.
- A9P means A is the husband of P.
- A5P means A is the daughter of P.

Which of the following means that K is the mother-in-law of M?

(A) M9N3K4J

(B) M9N5K3J

(C) K5J9M3N

(D) K3J9N4M

59. Q, W, E, R, T and Y are members of a family consisting of two children, one of whom is T is a boy. Q and R are brothers and Q is an engineer. E is a doctor married to one of the brothers. W is married to R, and Y is their only child. How T is related to Q?

(A) Father

(B) Brother

(C) Nephew

(D) Son

60. K is the son of A's mother's sister. Q is daughter of D, who is the father of G and grandfather of A. P is the daughter of H, who is grandmother of K. D is husband of H and G is husband of L. How is P related to Q?

(A) Mother

(B) Sister

(C) Daughter

(D) Cousin

61. The mode of a continuous frequency distribution can be determined graphically from

(A) By using Histogram

(B) By using frequency polygon

(C) By using ogive

(D) By using frequency curve

62. Frequency density corresponding to a class interval for the continuous frequency distribution, is the ratio of

(A) class frequency to the total frequency

(B) class frequency to the class length

(C) class length to the class frequency

(D) class frequency to the cumulative frequency

63. The curve obtained by joining the points, whose X co-ordinates are the upper limits of the class intervals and Y co-ordinates are corresponding cumulative frequencies, is called

(A) Ogive

(B) Histogram

(C) Frequency polygon

(D) Frequency curve

64. The following data relate to the wages of a group of workers:

Wages (in ₹)	Below 100	Below 200	Below 300	Below 400
No. of workers:	15	38	65	90

How many workers got wages more than 300?

(A) 25

(B) 65

(C) 90

(D) 27

65. The law of statistical regularity says that

(A) Sample drawn from the population under discussion possesses the characteristics of population.

(B) A large sample drawn at random from the population would possess the characteristics of the population.

(C) A large sample drawn at random from the population would possess the characteristics of the population on an average.

(D) An optimum level of efficiency can be attained at a minimum cost.

66. A population comprises 5 members. The number of possible samples of size 2, that can be drawn from it with replacement is

(A) 100

(B) 15

(C) 125

(D) 25

67. Which of the following statements about simple random sampling is NOT true?

(A) Simple random sampling ensures that each unit in the population has an equal chance of being selected.

(B) In simple random sampling with replacement, each selected unit is replaced to the population before the next unit is drawn.

(C) Simple random sampling is highly effective when the population is very large and heterogeneous.

(D) In a simple random sampling without replacement, a unit is selected, it will never be selected again.

68. A frequency curve which starts with a minimum frequency and then gradually reaches its maximum frequency at the other extremity is known as

(A) Bell shaped curve

(B) Mixed curve

(C) U-shaped curve

(D) J-shaped curve

69. In tabulation, source of data, if any, is shown in the

(A) Footnote

(C) Stub

(B) Body

(D) Caption

70. A helicopter flies from A to B at the rate of 500 km/hr. and comes back at the rate 700 km/hr. The average speed of the helicopter is

(A) 600 km/hr.

(B) 583.33 km/hr.

(C) $100\sqrt{35}$ km/hr.

(D) 620 km/hr.

71. If Arithmetic Mean (A.M.) and Geometric Mean (G.M.) of two numbers are 6.50 and 6 respectively, then the two numbers are

(A) 6 and 7

(B) 9 and 4

(C) 10 and 3

(D) 8 and 5

72. Which of the following is not a method of dispersion?

(A) Standard deviation

(B) Mean deviation

(C) Range

(D) Concurrent deviation method

73. Find out co-efficient of variation, if N = 14, $\Sigma fx = 280$ and σ(S.D.) = 3.

(A) 20

(B) 15

(C) 4.67

(D) Zero

74. The monthly profit/loss for six months of the firm is as under:

Months	January	February	March	April	May	June
Profit/loss (in ₹):	1,000	900	0	-200	-400	2,000

The co-efficient range of the above data is

(A) 122

(B) 150

(C) 33.33

(D) 55.55

75. Which one of the following is the absolute measure of dispersion for open ended distributions?

(A) Range

(B) Standard deviation

(C) Mean deviation

(D) Quartile deviation

76. If the mean of the following frequency distribution is 2.6, then the value of Y is

Marks (X)	1	2	3	4	5
No. of Students (f)	8	10	Y	2	4

(A) 16

(B) 6

(C) 26

(D) 12

77. Which one of the following measures of central tendency is based on only fifty percent (50%) of the central values?

(A) Geometric Mean

(B) Harmonic Mean

(C) Median

(D) Mode

78. The Arithmetic Mean (A.M.) and mode of the data are 32 and 26, respectively, then find the median of the data.

(A) 30

(B) 12

(C) 6

(D) 29

79. Find out the mode from the following data: 100, 110, 125, 225, 325, 125, 90, 80, 455, 375, 125

(A) 325

(B) 110

(C) 455

(D) 125

80. Two dice are thrown simultaneously. Find the probability that the sum of digits on the two dice would be 8 or more.

(A) $\frac{5}{18}$

(B) $\frac{5}{12}$

(C) $\frac{5}{36}$

(D) $\frac{8}{20}$

81. A number is selected from the first 20 natural numbers. Find the probability that it would be divisible by 3 or 7.

(A) $\frac{7}{20}$

(B) $\frac{12}{37}$

(C) $\frac{24}{67}$

(D) $\frac{8}{20}$

82. A father had three sons namely, Kailash, Harish and Prakash. All are above 65 years in age. Prakash happens to be the eldest while Kailash as youngest. As per the health history, it is estimated that the probability that Kailash survives another 5 years is $\frac{4}{5}$ Harish survives another 5 years is $\frac{3}{5}$ and Prakash survives another 5 years is $\frac{1}{2}$ The probabilities that Kailash and Harish survive another 5 years is 0.46, Harish and Prakash survive another 5 years is 0.32 and Kailash and Prakash survive another 5 years is 0.48. The probability that all three sons survive another 5 years is 0.26. What shall be the probability that at least one of them survives another 5 years?

(A) 0.78

(B) 0.72

(C) $\frac{7}{10}$

(D) $\frac{9}{10}$

83. In a class, there are 15 boys and 10 girls. Three students are selected at random. The probability that 1 girl and 2 boys are selected is

(A) $\frac{21}{46}$

(B) $\frac{25}{17}$

(C) $\frac{1}{50}$

(D) $\frac{3}{25}$

84. Two cards are drawn from a pack of 52 cards. The probability that one is a spade and one is a heart; is

(A) $\frac{3}{20}$

(B) $\frac{29}{34}$

(C) $\frac{47}{100}$

(D) $\frac{13}{102}$

85. A problem is given to 5 students P, Q, R, S and T. If the probability of solving the problem individually is $\frac{1}{2},\frac{1}{3},\frac{2}{3},\frac{1}{5}$ and $\frac{1}{6}$probability that the problem is solved. and 1/6 respectively, then find the

(A) 0.47

(B) 0.93

(C) 0.57

(D) 0.27

86. In a leap year, what is the probability that there will be 53 Sundays?

(A) $\frac{53}{365}$

(B) $\frac{1}{7}$

(C) $\frac{3}{7}$

(D) $\frac{2}{7}$

87. Poisson probability distribution is appropriately applied in

(A) The height of students in the university.

(B) The distribution of passing of students in university examinations.

(C) Tossing of a coin hundred times.

(D) Number of deaths by a rare disease.

88. If the points of inflexion of a normal curve are 6 and 14, then standard deviation of the distribution is

(A) 4

(B) 8

(C) 9.17

(D) 32

89. What is the probability of making 3 corrected guesses in 5 True-False answer type questions?

(A) 0.3125

(B) 0.4156

(C) 1.3888

(D) 0.5235

90. If 5% of the families in large population city do not use gas as a fuel, what will be the probability of selecting 10 families in a random sample of 100 families who do not use gas as a fuel?

[Given that $e^{-5}=0.0067$]

(A) 0.038

(B) Zero

(C) 0.018

(D) 0.048

91. The correlation co-efficient between X and Y is 0.8. If we add a number 10 in the X variable and subtracted 20 from Y variable, then the new correlation co-efficient will be -

(A) 0.4

(B) 0.6

(C) 0.9

(D) 0.8

92. When both the regression co-efficients are b_{xy} = 0.7 and b_{yx} = 0.8, respectively, then correlation co-efficient between x and y is

(A) 0.75

(B) 0.56

(C) 0.28

(D) 0.87

93. For 9 college students group, the sum of squares of differences in ranks for History and Hindi marks was found to be 62, then what is the value of rank correlation co-efficient?

(A) 1

(B) 0.48

(C) 0.52

(D) 0.87

94. If r = 0.7 then co-efficient of non-determination is

(A) 0.49

(B) 0.51

(C) Zero

(D) 0.71

95. Given x = 2y + 4 and y = kx + 6 are the two lines of regression x on y and y on x respectively. If the value of correlation co-efficient (r) is 0.5, then the value of k is

(A) $\frac{1}{8}$

(B) $\frac{1}{4}$

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

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

96. If $\sum P_n q_n = 249$, $\sum P_0 q_0 = 150$, $\sum P_n q_0 = 145$ and Paasche's Index Number = 150, then Fisher's Ideal Price Index Number is

(A) 75

(B) 126.9

(C) 120.62

(D) 171

97. From the following data, find out an Index number for 2022 taking 2021 as base (using simple aggregative method):

Commodities	Price in 2021	Price in 2022
A	80	120
B	220	200
C	300	400

(A) 100

(B) 120

(C) 108

(D) 190

98. From the following chain base index numbers based on 2015, find out new chain base index number for the year 2022 by shifting the base year 2019.

Years:	2015	2016	2017	2018	2019	2020	2021	2022
Index No: (Base 2015)	100	105	95	85	120	110	130	150

(A) 125

(B) 180

(C) 100

(D) 150

99. The prices of a commodity in the years 2015 and 2020 were 50 and 60 respectively. Price relative of 2015 on 2020 is

(A) 100

(B) 110

(C) 83.33

(D) 120

100. Chain Index is equal to

(A) $\frac{\text{link relative of current year} \times \text{chain index of current year}}{100}$

(B) $\frac{\text{link relative of previous year} \times \text{chain index of current year}}{100}$

(C) $\frac{\text{link relative of current year} \times \text{chain index of previous year}}{100}$

(D) $\frac{\text{link relative of previous year} \times \text{chain index of previous year}}{100}$

SUGGESTED ANSWER

QUANTITATIVE APTITUDE

ANSWER

MCQ	Correct Option	MCQ	Correct Option	MCQ	Correct Option	MCQ	Correct Option
1.	(B)	26.	(C)	51.	(D)	76.	(A)
2.	(B)	27.	(A)	52.	(B)	77.	(C)
3.	(B)	28.	(B)	53.	(C)	78.	(A)
4.	(D)	29.	(C)	54.	(D)	79.	(D)
5.	(C)	30.	(B)	55.	(D)	80.	(B)
6.	(D)	31.	(D)	56.	(C)	81.	(D)
7.	(C)	32.	(A)	57.	(D)	82.	(D)
8.	(C)	33.	(A)	58.	(B)	83.	(A)
9.	(A)	34.	(C)	59.	(D)	84.	(D)
10.	(D)	35.	(A)	60.	(B)	85.	(B)
11.	(C)	36.	(D)	61.	(A)	86.	(D)
12.	(C)	37.	(A)	62.	(B)	87.	(D)
13.	(D)	38.	(A)	63.	(A)	88.	(A)
14.	(B)	39.	(B)	64.	(A)	89.	(A)
15.	(A)	40.	(B)	65.	(C)	90.	(C)
16.	(C)	41.	(B)	66.	(D)	91.	(D)
17.	(B)	42.	(A)	67.	(C)	92.	(A)
18.	(C)	43.	(B)	68.	(D)	93.	(B)
19.	(B)	44.	(C)	69.	(A)	94.	(B)
20.	(A)	45.	(C)	70.	(B)	95.	(A)
21.	(C)	46.	(C)	71.	(B)	96.	(C)
22.	(A)	47.	(D)	72.	(D)	97.	(B)
23.	(D)	48.	(B)	73.	(B)	98.	(A)
24.	(D)	49.	(A)	74.	(B)	99.	(C)
25.	(D)	50.	(D)	75.	(D)	100.	(C)

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SEP 2025

PAPER – 3: QUANTITATIVE APTITUDE

All Question are compulsory.

Time: 2 Hours **Marks: 100**

1. The value of x in $\log_x(4)+\log_x(16)+\log_x(64)=12$ is _____

   (A) 1

   (B) 2

   (C) 3

   (D) 4

2. XYZ invested ₹ 1,68,000 in a business. After a few months, MNP joined in the business by investing ₹ 1,12,000 in the business. At the end of year, the total profit was divided between them in the ratio 2:1. After how many months, did MNP join the business?

   (A) 3

   (B) 2

   (C) 4

   (D) 9

3. The value of $\log_{\sqrt{a}}\left(\sqrt{a\sqrt{a\sqrt{a\sqrt{a}}}}\right)$ is _____

   (A) $\frac{7}{8}$

   (B) $\frac{15}{16}$

   (C) $\frac{15}{8}$

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

4. The ratio of $\frac{1}{2}\sqrt{35}:\frac{1}{3}\sqrt{140}$ is equal to the ratio _____

(A) 4:3

(B) 2:1

(C) 5:4

(D) 3:4

5. If α and β are the roots of the equation x^2-x-6=0, then the value of $\alpha^3+\beta^3+\alpha^2+\beta^2+\alpha+\beta$ is equal to _____

(A) 35

(B) 29

(C) 31

(D) 33

6. The roots of the equation $\left(\frac{x}{x-1}\right)^2-5\left(\frac{x}{x-1}\right)+6=0$ are:

(A) 2, 3/2

(B) 3,1/2

(C) 2,1/3

(D) 3, 2/3

7. If α and β are the roots of the equation $2x^2$-6x+3=0, then the equation with the roots $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ is----------

(A) x^2+4x +1=0

(B) x^2-4x +1=0

(C) x^2-4x -1=0

(D) x^2+4x -1=0

8. Which of the following is a solution of the inequality $\frac{5x}{3} \leq \frac{x}{6} - 5$?

(A) $(-\infty, -\frac{10}{3}]$

(B) $(-\infty, -\frac{10}{3})$

(C) $(-\infty, -\frac{8}{3}]$

(D) $(-\infty, -\frac{8}{3})$

9. The number of solutions of $\frac{5-2x}{4} \leq \frac{x}{8} - 5 > 3-2x$ are _____, where x is a real number.

(A) Infinitely many

(B) Only two

(C) Exactly one

(D) No solution

10. The region specified by the inequalities $10x+29y \geq 40$ and $15x-4y \leq 25$ includes the point _____

(A) (1,1.25)

(B) (3,2.25)

(C) (2.5,2.5)

(D) (4,1.25)

11. The compound interest on ₹ 1,00, 000 compounded quarterly, for 9 months at 4% per annum is ₹ _____

(A) 3010.1

(B) 3030.1

(C) 3330.1

(D) 3003.1

12. The difference between the compound interest and the simple interest on a certain sum at 12% per annum for 2 years is ₹ 90, when the interest is compounded annually. Then the sum is ₹ _____

(A) 6150

(B) 6050

(C) 6350

(D) 6250

13. A machine is depreciated at the rate of 15% on the reducing balance. The original cost of machine was ₹ 2,00,000. In approximately how many years, the value of machine was ₹ 54,000? (Given: $0.85^4 = 0.522$)

(A) 9

(B) 6

(C) 8

(D) 7

14. Mohan invests ₹ 25,000 every year starting from today for next 5 years Interest rate is 7% per annum compounded annually. The future value of the annuity is ₹_____. (Given $(1+0.07)^5 = 1.40255$)

(A) 1,46,768

(B) 1,43,768

(C) 1,45,768

(D) 1,44,768

15. Mr. X borrowed ₹ 6000 from Mr. Y at 10% per annum simple interest. After two years Mr. X wanted to repay this amount, Mr. Y is insisted on paying the amount at compound interest at the same rate compounded annually. How much extra does Mr. X have to pay?

(A) ₹ 60

(B) ₹ 1260

(c) ₹ 1200

(d) ₹ 80

16. If ₹ 2,470 is obtained as an interest in 4 years and 4 months at the rate of 3% per annum simple interest rate in bank deposit, how much amount was deposited in ₹?

(A) 17,000

(B) 18,000

(C) 19,000

(D) 20,000

17. The compound interest of ₹ 4,900 is ₹ 1661 for 2 years at a certain rate of interest, compounded annually. What is the rate of interest per annum in percentage?

(A) 19.71

(B) 17.71

(C) 13.71

(D) 15.71

18. If Mr. XYZ is investing ₹ 86,000 in a bank fixed deposit scheme where interest will be payable at 12% per annum, compounded half-yearly, what will be the effective rate of interest in a year?

(A) 12.36%

(B) 12.24%

(C) 12.12%

(D) 12.48%

19. Ms. Y invested ₹ 2,00,000 in a mutual fund equity scheme. She redeemed entire investment after 96 months and received ₹ 6,00,000 after redemption. What was the Compound Annual Growth Rate (CAGR) in percentage? (Given: $1.1472^4 = 1.732$)

(A) 14.72

(B) 15.72

(C) 13.72

(D) 12.72

20. A loan of ₹ 5,000 is lent for three years at the rate of 10% per annum, compounded semi-annually. The future value of the money is ₹ _____ (Given: $1.05^6 = 1.34$)

(A) 6,500

(B) 6,600

(C) 6,700

(D) 6,800

21. One person wants to have ₹ 20,000 at the end of six years. Hence, he deposits ₹ _____ (rounded in rupee) in a fund that pays 3% per annum, compounded annually. (Given : $1.03^6 = 1.194$)

(A) 17,000

(B) 17,250

(C) 17,750

(D) 16,750

22. Suppose you deposit ₹ 1,000 today, ₹ 2,000 after one year from today and 3,000 after two years from today, in a deposit that pays 10% per annum, compounded annually. What is the balance in the deposit at the end of two year in just after deposit of ₹ 3,000?

(A) 6,000

(B) 6,410

(C) 6,600

(D) 6,800

23. You are interested in an investment of ₹ 5,000 in a fund that promises ₹ 50 at the end of each year, forever. What is the annual interest rate on this investment?

(A) 1%

(B) 2%

(C) 1.5%

(D) 2.5%

24. An investment was priced at ₹ 100 per share in year 0, priced at 150 per share in the end of the first year, and priced ₹ 200 per share in the end of second year. What is the Compound Annual Growth Rate (CAGR) of the investment?

(A) 21.42%

(B) 31.42%

(C) 41.42%

(D) 51.42%

25. How many different words from the letters of the word MATHEMATICS can be formed so that all the vowels always come together in any word?

(A) 10080

(B) 120960

(C) 4989600

(D) 20160

26. Find n if ${}^{n}P_{5} = 20\ {}^{n}P_{3}$

(A) 7

(B) 8

(C) 9

(D) 10

27. In a school, for a class monitor selection, there are 6 candidates, and students need to choose up to 3 monitors. A student can vote for 1 or 2 or 3 candidates. In how many ways a student can vote?

(A) 41

(B) 42

(C) 43

(D) 44

28. Different words are made with rearrangement of letters of the word "TROPICAL" in a way that the vowels occupy odd places when counted from left. How many such words are there?

(A) 720

(B) 1440

(C) 2880

(D) 2160

29. The common difference of the arithmetic progression $\frac{1}{3}, \frac{1-3b}{3}, \frac{1-6b}{3}$.... is _____.

(A) -b

(B) b

(C) -3b

(D) 3b

30. If the numbers x, 2x + 2 and 3x + 3 are in the geometric progression, then the fourth term of the progression is _____.

(A) 27

(B) -27

(C) 13.5

(D) -13.5

31. The sum of all natural numbers between 200 and 600 those are divisible by 13 is _____.

(A) 12493

(B) 14493

(C) 16493

(D) 18493

32. The sum of first two terms of a geometric progression is 14 and its infinite sum i.e. sum up to infinity is 32. What is the common ratio of the progression?

(A) 0.5

(B) 0.75

(C) 1.25

(D) 0.25

33. For a relation R, aRb represents that a is related to b. If for all a, b, c, aRb and bRc gives that aRc, then the relation is _____.

(A) Reflexive

(B) Symmetric

(C) Transitive

(D) Asymmetric

34. Let S = {a, b, c, d, e}. The number of non-empty proper subsets of S is _____.

(A) 30

(B) 31

(C) 32

(D) 28

35. If $f(y)=\frac{1}{1+y}$ and $g(y)=\frac{y+1}{y}$ then fog(y)= ____

(A) $\frac{y}{2y+1}$

(B) $\frac{2y}{y+1}$

(C) $\frac{2y+1}{y}$

(D) $\frac{y+1}{y}$

36. The inverse of the function $f(x)=\frac{2+3x}{x+5}$, by taking f(x) as y, is _____

(a) $\frac{2+5y}{y+3}$

(b) $\frac{2-5y}{y+3}$

(c) $\frac{2-5y}{y-3}$

(d) $\frac{2+5y}{y-3}$

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

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

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

(C) $\frac{dy}{dx}=\frac{-2y^2x+1}{2y^2x^2}$

(D) $\frac{dy}{dx}=\frac{2y^2x-1}{2y^2x^2}$

38. The cost function of an organisation as $C(x) = 500-5x^2+\frac{x^3}{3}$, where x denotes the output. Find the level of output at which marginal cost is the minimum.

(A) 5

(B) 4

(C) 10

(D) 6

39. The value of $\int_0^4 \frac{x+3}{x+2}dx$ is _____.

(A) $4-\log_e 6-\log_e 2$

(B) $4+\log_e 6-\log_e 2$

(C) $4+\log_e 6$

(D) $4+\log_{10} 6-\log_{10} 2$

40. The value of $\int_3^4 \frac{2x}{1+x^2}dx$ *is* _____.

(A) $\log\frac{16}{10}$

(B) $\log\frac{17}{10}$

(C) $\log\frac{16}{9}$

(D) $\log\frac{17}{9}$

41. Complete the given series: 0, 6, 24, 60, 120, 210, _____.

(A) 240

(B) 290

(C) 336

(D) 504

42. Find the odd one out in the series: 2, 5, 10, 17, 26, 37, 50, 64.

(A) 17

(B) 26

(C) 37

(D) 64

43. If in a certain language, MADRAS is coded as NBESBT. How is DELHI coded in that language?

(A) EMFIJ

(B) EFMIJ

(C) EFMKJ

(D) EFJMI

44. In a certain code, GLAMOUR is written as IJCNMWP and MISRULE is written as OGUSSNC, then how will MUSICAL be written in that code?

(A) OSUJECN

(B) OSUHACJ

(C) OSUJACJ

(D) OSUJABJ

45. In the following series, one term is wrong. Find out the wrong term.

48, 50, 82, 170, 290

(A) 48

(B) 50

(C) 82

(D) 170

46. Suresh started walking 4 km west from his office. Then he turned right and walked 2 km. Again he turned right and walked 2 km to reach his house. In which direction is Suresh's house from his office?

(A) South

(B) South-East

(C) North-West

(D) East

47. Mr. PQR walked 50 metres towards east, took a right turn and walked 40 metres. Then he took a left turn and walked 30 metres. In which direction is he now from the starting point?

(A) North-East

(B) East

(C) South-East

(D) South

48. Starting from point A, PQ walked 40 metres south. She turned left and walked 40 metres. She then turned left and walked 40 metres. She again turned left and walked 60 metres and reached point B. How far and in which direction is the point B from the point A?

(A) 20 metres West

(B) 20 metres East

(C) 30 metres West

(D) 10 metres West

49. Two persons, P and Q, start walking from a meeting point towards North. After walking 100 metres, P turns left and Q turns right. P, after walking 50 metres, takes a left turn and walks 150 metres. But Q walks 30 metres, turns to his right and walks 90 metres. What is the shortest distance between P and Q now in metres?

(A) 80

(B) 90

(C) 100

(D) 110

50. A hunter is chasing a deer, by running 200 metres in east direction, turns to his right, runs 100 metres and turns to his right, runs 90 metres. Turning to his left, he runs 50 metres and then turns to left, runs 120 metres. Finally, he turns to left and runs 60 metres. He finds the deer in front of him at 100 metres. In which direction is the hunter standing with respect to the deer now?

(A) South

(B) North

(C) East

(D) West

51. Six persons A, B, C, D, E and F are sitting in a circle facing the centre. A is facing D. C is left of A and right of E. D is between B and E. F is right of A. Which one of the following statements is incorrect?

(A) F and C are neighbours.

(B) F is between A and B.

(C) F and A are neighbours.

(D) B is left of D.

52. Six persons A, B, C, D, E and F are sitting in two rows with 3 persons in each row facing same side. C is sitting in the middle of first row. B is sitting in the left of C. E is also sitting in the middle. A is sitting in the right of E. F is sitting in the right of C. Who is not sitting at one of the ends of any row?

(A) A

(B) E

(C) D

(D) F

53. Six people, A, B, C, D, E and F are sitting in a hexagonal shape. All the sides of the hexagon so formed are of same length. A is not adjacent to B or C; D is not adjacent to C or E; B and C are adjacent; F is in the middle of D and C. Which of the following is not a correct neighbour pair?

(A) A and F

(B) D and F

(C) B and E

(D) C and F

54. Seven persons with names T, B, L, A, P, Z and R are standing in a row, facing East. It is given that T is to the right of R; A is between B and Z, L, who is third to the left of B, is at the end; R is fourth to the right of L. Who is at the immediate right of T?

(A) Z

(B) B

(C) P

(D) R

55. Eight friends with names P, Q, R, S, T, U, V and W are sitting on a bench and facing North. U is sitting between S and V; Q is sitting between W and P; T is third to the left of V; W is third left of R; V is sitting at one of the corners. Who is sitting immediate right of W?

(A) P

(B) Q

(C) R

(D) T

56. A girl introduced a boy as the son of daughter of the father of her uncle. The boy is girl's

(A) Father

(B) Son

(C) Uncle

(D) Cousin/Brother

57. A and B are Brothers. C and D are Sisters. A's son is D's Brother. How is B related to C?

(A) Father

(B) Brother

(C) Grandfather

(D) Uncle

58. Ms. X told Ms. Y, "The girl I met yesterday at the market was the youngest daughter of the brother-in-law of my friend's mother." How is the girl related to Ms. X's friend?

(A) Cousin

(B) Daughter

(C) Niece

(D) Aunt

59. There are six members, named as, A, B, C, D, E and F. It is given that E is the brother of A's husband; F is the mother of E; B is the daughter of D and A and is the granddaughter of C. How is C related to E?

(A) Son

(B) Father

(C) Brother

(D) Grandfather

60. It is given that a person named as A is married to B; the person E is a brother of D and the person B is the mother of C whose sister is D. How is D related to A?

(A) Sister

(B) Aunt

(C) Daughter

(D) Granddaughter

61. Sampling method which belongs to the category of Mixed sampling is

(A) Systematic Sampling

(B) Simple Random Sampling

(C) Stratified Sampling

(D) Multi-stage Sampling

62. Number of students in a college is an example of

(A) An attribute

(B) A discrete variable

(C) A continuous variable

(D) A constant

63. For manifold classification, this method of presentation of data cannot be recommended:

(A) Textual presentation

(B) Tabular presentation

(C) Bar Diagram

(D) Pie Chart

64. The most commonly used distribution is _____ in which the maximum frequency is at the central part and the frequency decreases when one moves away from the central part on either the left side or the right side.

(A) Bell-shaped curve

(B) U-shaped curve

(C) J-shaped curve

(D) Mixed curve

65. Which of the followings is not a basic principle of sample survey?

(A) Principle of Inertia

(B) Principle of Optimization

(C) Principle of Large Numbers

(D) Law of Statistical Regularity

66. After a singing competition on a live TV show, the winner is selected according to the number of likes each candidate has received on a messaging app. This method of data collection is known as _____ sampling.

(A) Random

(B) Probabilistic

(C) Purposive

(D) Multi-Stage

67. A bar chart can be drawn for the data having numbers on

(A) Students of various disciplines

(B) Persons of different age groups

(C) Sales of a commodity over a year

(D) Temperature recorded during a month.

68. An investigator collects information on salaries received by 1000 persons. From this collection, the data on women are extracted. Now the data is called _____ data.

(A) Primary

(B) Secondary

(C) Census

(D) Ordinal

69. Two sales-persons present their numbers of sales per week for a month. An appropriate diagram that can be drawn for this data is _____

(A) Histogram

(B) Pie chart

(C) Ogive

(D) Adjacent bar chart

70. If X and Y are related by 4X+3Y+5=0 and Mean of X is 10, then the Mean of Y is

(A) -23

(B) -15

(C) -20

(D) 23

71. For a moderately skewed distribution of marks in English for a group of 145 students the mean marks and median marks were found to be 55.10 and 52.40, respectively. The modal marks are -

(A) 47

(B) 42

(C) 53.1

(D) 52.2

72. If there are two groups with 10 and 12 observations and harmonic mean of the two groups are 3 and 5 respectively, then the combined Harmonic mean is

(A) 8.0

(B) 2.0

(C) 3.8

(D) 4.0

73. Best measure of Dispersion for open-end classification is the _____, which does not change with the change of _____.

(A) Quartile Deviation, Scale

(B) Standard Deviation, Scale

(C) Quartile Deviation, Origin

(D) Standard Deviation, Origin

74. Coefficient of range of 84, 93, 53, 70, 82, 65 is

(A) 28.38

(B) 27.39

(C) 26.75

(D) 29.31

75. Calculate the Harmonic Mean of 1, $\frac{1}{3}, \frac{1}{6}$ and $\frac{1}{9}$

(A) 2.48

(B) 0.21

(C) 0.31

(D) 0.25

76. Find the Coefficient of variation for the following numbers; 7,5,9,3,6

(A) 33.33

(B) 66.66

(C) 3

(D) 300

77. A set contains seven numbers whose average is 12. The average of four greater numbers is 18 and the average of four smaller numbers is 8. Which of the followings is the value of one of the numbers?

(A) 12

(B) 16

(C) 18

(D) 20

78. If the sum of ten values is 20 and sum of squares of these values is 80, then the standard deviation is _____.

(A) 1

(B) 2

(C) 1/2

(D) 4

79. A data set has first eleven positive multiples of 6. The semi inter-quartile range is _____.

(A) 12

(C) 18

(B) 24

(D) 36

80. The number of tosses of a coin, that are needed so that the probability of getting at least one head is 0.875, is

(A) 2

(C) 4

(B) 3

(D) 5

81. Two-person X and Y appear in an interview for two vacancies for the same post. The probability of X's selection is 1/5 and that of Y's selection is 1/3. The probability that none of them will be selected is

(A) 7/15

(B) 8/15

(C) 9/15

(D) 10/15

82. A number is selected at random from the first 50 natural numbers. What is the probability that it would be either a two-digit prime number or a composite number lying between 5 and 40?

(A) 0.54

(B) 0.48

(C) 0.64

(D) 0.72

83. Some dice with six faces have numbers written from Four to Nine. Two such dice are thrown simultaneously. Find the probability that the sum of numbers on the two dice would be 14 or less.

(A) 11/18

(B) 13/18

(C) 1/6

(D) 2/9

84. Three components A, B and C are manufactured separately and then assembled into a finished product. While producing the three components, it is found that 5 percent of component A, 4 percent of component B and 1 percent of component C are defective. What is the probability that the assembled product is free from defects?

(A) 0.75

(B) 0.8

(C) 0.85

(D) 0.9

85. Two persons are playing a set of matches. The winner of 4 matches is declared as the winner. Any player has 50% chance to win a match. The probability that the game comes to an end at the fourth match is _____.

(A) 5/8

(B) 4/8

(C) 3/8

(D) 1/8

86. The Mode of binomial distribution B (7,1/3) is

(A) 3

(B) 2

(C) 7/3

(D) 8/3

87. An emergency room receives an average of 3 patients per hour. What is the probability that exactly 2 patients arrive in an hour? (Given: $e^{0} = 1$, $e^{-1} = 0.367$, $e^{-2} = 0.135$, $e^{-3} = 0.049$, $e^{-4} = 0.018$, $e^{-5} = 0.0067$)

(A) 0.22

(B) 0.3

(C) 0.27

(D) 0.25

88. If a binomial distribution has n = 20 and p = 0.3 what is its variance?

(A) 4.2

(B) 5.6

(C) 3.4

(D) 2.9

89. It is given that X has normal distribution with mean zero and standard deviation one. Also given that P [- 2 < X < 2] = 0.95, P[- 2 < X < - 1.5] = 0.045. Find the probability for P[0 < x < 1.5].

(A) 0.63

(B) 0.53

(C) 0.33

(D) 0.43

90. The probability mass function of a distribution is given below in a tabular form:

x	0	1	2	3	4
p(x)	k	$2k + k^2$	3k	$2k + k^2$	k

Where k is a non-negative constant. The median of the distribution is

(A) 3k

(B) 2

(C) 2k

(D) 3

91. For a group of students, the sum of squares of differences in ranks for Maths and Physics marks are found to be 60, which is 120 times the value of rank correlation coefficient. How many students are there in the group?

(A) 8

(B) 10

(C) 9

(D) 12

92. If two variables move in the same direction i.e. an increase (or decrease) on the part of one variable introduces an increase (or decrease) on the part of the other variable, then the two variables are known to be

(A) Positive correlation

(B) Negative correlation

(C) Zero correlation

(D) Curvilinear correlation

93. If m + 3x=10 and 2y + 5n=25 and regression coefficient of y on x is 0.80, what is the regression coefficient of n on m?

(A) -0.106

(B) 9.375

(C) 0.106

(D) 0.0106

94. If the regression coefficient b_{yx} is greater than one, then the regression coefficient b_{xy}

(A) cannot be less than one

(B) cannot be greater than one

(C) can be equal to one

(D) can be equal to zero

95. The sum of squares of the differences between two ranks awarded by two judges on 10 candidates is _____ if the rank correlation coefficient is 0.8.

(A) 44

(B) 55

(C) 66

(D) 33

96. Two indices that is current on base and base on current should be reciprocals of each other in

(A) Unit test

(B) Time reversal test

(C) Circular test

(D) Average weighted test

97. If $\Sigma p_0q_0 = 160.7$ and $\Sigma p_1q_0 = 178.6$, then the cost of living index is

(A) 111.14

(B) 93.10

(C) 104.71

(D) 105.7

98. Which sampling technique can be used for the construction of Index numbers?

(A) Systematic sampling

(B) Quota sampling

(C) Cluster sampling

(D) Random sampling

99. From the year 2015 to 2025, Consumer price index increased from 125 to 196. During this period, salary of the employees as per 7th pay commission recommendations was revised from ₹ 25,000 to ₹ 37,250. In real terms, an employee should get following amount as an additional amount to maintain his previous standard of living:

(A) ₹ 1,965

(B) ₹ 1,950

(C) ₹ 1,945

(D) ₹ 14,200

100. If the consumer price index number is 750, then the purchasing power of one rupee is _____.

(A) 12.5 paise

(B) 15 paise

(C) 13.3 paise

(D) 16.5 paise

SUGGESTED ANSWERS — FOUNDATION EXAMINATION: SEPTEMBEER 2025

Answer Key

1.	**(B)**	2.	**(A)**	3.	**(C)**	4.	**(D)**	5.	**(D)**
6.	**(A)**	7.	**(B)**	8.	**(A)**	9.	**(A)**	10.	**(A)**
11.	**(B)**	12.	**(D)**	13.	**(C)**	14.	**None of the options were correct***	15.	**(A)**
16.	**(C)**	17.	**(D)**	18.	**(A)**	19.	**(A)**	20.	**(C)**
21.	**(D)**	22.	**(B)**	23.	**(A)**	24.	**(C)**	25.	**(B)**
26.	**(B)**	27.	**(A)**	28.	**(C)**	29.	**(A)**	30.	**(D)**
31.	**(A)**	32.	**(B)**	33.	**(C)**	34.	**(A)**	35.	**(A)**
36.	**(C)**	37.	**(B)**	38.	**(A)**	39.	**(B)**	40.	**(B)**
41.	**(C)**	42.	**(D)**	43.	**(B)**	44.	**(C)**	45.	**(A)**
46.	**(C)**	47.	**(C)**	48.	**(A)**	49.	**(C)**	50.	**(A)**
51.	**(A)**	52.	**(B)**	53.	**(A)**	54.	**(C)**	55.	**(B)**
56.	**(D)**	57.	**(D)**	58.	**(A)**	59.	**(B)**	60.	**(C)**
61.	**(A)**	62.	**(B)**	63.	**(A)**	64.	**(A)**	65.	**(C)**
66.	**(C)**	67.	**(A)**	68.	**(B)**	69.	**(D)**	70.	**(B)**
71.	**(A)**	72.	**(C)**	73.	**(C)**	74.	**(B)**	75.	**(B)**
76.	**(A)**	77.	**(D)**	78.	**(B)**	79.	**(C)**	80.	**(B)**
81.	**(B)**	82.	**(D)**	83.	**(B)**	84.	**(D)**	85.	**(D)**
86.	**(B)**	87.	**(A)**	88.	**(A)**	89.	**(D)**	90.	**(B)**
91.	**(C)**	92.	**(A)**	93.	**(C)**	94.	**(B)**	95.	**(D)**
96.	**(B)**	97.	**(A)**	98.	**(D)**	99.	**(B)**	100.	**(C)**

*Correct answer is 1,53,832.

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STUDENTS SPEAK

AIR 26
SURAJ BAKLIWAL
ST. XAVIERS COLLEGE

Studying from niraj sir was an amazing experience. He is unlike all the teachers who have taught me. Sir is always ready for help no matter what the problem is, no matter what time itis. He has given me personal guidance throughout the course and the general teacher-student relation has become more like friendship. The study material given by sir is fully exhaustive and second to none. In addition to the classroom teaching , sir also motivated us alot and didn't only show us the dream of getting a rank but also helped us in every way possible as if it were a dream of his own. I would like to thank sir for everything and suggest everyone to take his classes to experience the excellence!

I m quite grateful to be a part of NAE family where I got to meet many new people and learn from extremely qualified teachers. Niraj sir helped me to shape my dream of becoming an AIR. Without his support it would have been very difficult. At each and every moment he supported me and encouraged me to improve myself. I m really thankful to him.

AIR 27
AMAN CHOWDHARY
ST. XAVIERS COLLEGE

AIR 31
RAHUL AGARWAL
ST. XAVIERS COLLEGE

Association with NAE was a great experience. Personal attention and doubt clearing (24×7) on any topic makes the faculty unique on its own. One feels good when you have a teacher as a friend. Focus on life examples supports in concept clarity and always motivating you to do more and better

Joining here was a very memorable experience for me. Niraj Sirwas not only my teacher, but a mentor for life. He is more of a friend to me. The regular tests helped me to identify my weaknesses and work upon them. The conceptual clarity they provided, helped me to clear my CAfoundation exam and secure an All India Rank.

AIR 28
YATHARTH CHOWDHURY
ST. XAVIERS COLLEGE

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STUDENTS SPEAK

AIR 34
YASH DAMANI
ST. XAVIERS COLLEGE

"An opportunity which everyone should capitalize on", that's what learning things from Niraj sir is. From late night calls to endless doubts I always knew that sir was available to help me get things back on track. With the overwhelming love I have got for the entire 6 months of my preparation time, I really discovered a friend in him more than a teacher. Dont know about others, but I will miss your classes and will keep cherishing the memories I have made there. To end things, I would just want to say that I'm thankful to sir because whatever I've achieved today is all because of the motivation I've been receiving from him throughout this journey.

Its been all in all a great experience learning from sir. He has been a great guide and mentor throughout my journey towards excellence. I am obliged to sir for all the contribution he has made. I will always keep learning something from you sir.

AIR 38
HARSHAT SINGH SALUJA
ST. XAVIERS COLLEGE

AIR 44
DEVANSH DAMANI
ST. XAVIERS COLLEGE

Stepping into the line of a professional career was a very new and exciting experience. It seemed that the boards exams was just a trailer while the movie is about to come. He is mentor not just for exams but for life who were instrumental in shaping my career. He kept me motivated throughout the 6 months of preparation. From books to revision papers to mock tests and obviously there vast knowledge, all together are more than sufficient for the preparation. The best thing in his teaching was the references to the practical world, which was a bonus for us. After all, their faith and dedication for us helped me achieve an AIR which was earlier only a dream. I greatly express my gratitude towards him.

It was my great opportunity and experience to study in this institute. He is very friendly with the students. He provides proper guideline and notes for each and every chapter. As a result of his hard efforts while teaching and preparing me for CA Foundation exam, I got 48th All India Rank

AIR 48
RAKESH KR SINGH
ST. XAVIERS COLLEGE

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Yagesh Jhawar
1 review
★★★★★

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NAE is not only a class but an family in itself wherein you are given the perfect atmosphere to study and also enjoy while doing so!
You'll regret if you miss the NAE experience!

Radhika Agrawal
1 review
★★★★★ a year ago

Niraj sir is the best sir I ever meet .... He is always ready to help in any situations 24X7 . he makes our concept clear , base strong along with cheering up and removing ur tension for exams by his motivation #togetherwecan . he not only support in studies but support morally . At the exam time sir provide personal attention , important updates , voice notes and precise notes at last moment along with very imp. Pdfs which helped a lot .... Even more effort for online and outsider students by giving his best and make them feel like offline only .... Thank you so much sir .... No words to thank you for what you did for me ....
Hats off sirr for your supper effort !!!

Piyali Ghosh
1 review
★★★★★ 3 months ago

One of my best decision is to choose NAE for C
foundation...Niraj sir is not just a teacher...he is
like a friend to us....any kind of problem we hav

Vinayak Gupta
2 reviews
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Well firstly, I am grateful to be a part of NAE.
It is not just like any other institute or tution which we usually see in every area rather it is a family .
Talking about the head of the Family Niraj sir he is a gem of person who was always there for you even at 2:40 am.
Honestly speaking Sir was there for us like a elder brother and a mentor from the day very first we met
m and you can learn a lot from sir apart from the course.
stly,One thing which I personally learned from sir was giving personal attention to everyone.

Sathi Shaw
1 review
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A teacher like Niraj Sir was just a dream for me that come true . His teaching skills and knowledge about everything is just awesome . More than a teacher he is our true friend a guidance in life that guides you in every aspect and an inspiration too .NAE is not just an institution, It's like our second home .#NAE FAMILY

Anjali Roy
1 review
★★★★★ a month ago

Hello everyone, I am elated to share my experience with the NAE. It was always my dream to become a CA and i am on the halfway of my dream just because of the support and guidance from the Niraj sir.
His commitment to providing every lecture with so much ease that it never feels like it was hard.The personalized attention and guidance I have received from Niraj Sir have been instrumental in my understanding of complex concepts, making the learning process not only insightful but also incredibly enjoyable.
His personality is so amazing that it always encourages the people around him to do the best thing in their life.
He is like a role model to me, who always encouraged me through out this rigorous yet the most beautiful journey.

Hiranmayee Revanur
8 reviews
★★★★★ a year ago

Apart from being an excellent teacher, Niraj sir is also a great mentor. He is always available to listen to the student's grievances and guide them through it, I am extremely grateful to him. Best teacher no doubt

Aritra Mondal
Local Guide · 44 reviews · 17 photos
★★★★★ 3 months ago

I had a fantastic experience at NAE. Sir is highly knowledgeable and supportive, always going the extra mile to ensure students understood complex concepts. The study materials are comprehensive and well-structured, making exam preparation efficient. Additionally, the regular mock tests helps me gauge my progress and build confidence. The institute's conducive learning environment and the personalized attention provided by sir is instrumental in my success. I highly recommend NAE to anyone aspiring to excel in their CA foundation exam.

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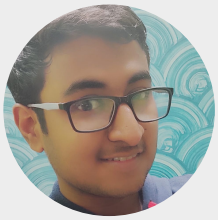

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Your Name

Work harder until you see your name here

KNOW YOUR FACULTY

Niraj Agarwal is a Chartered Accountant, Company Secretary, Cost & Management Accountant. He is an All India Rank Holder in all the 3 courses. He has graduated from St. Xavier's College, Kolkata and holds a Master's degree in Commerce too. He believes that learning is a continuous process and hence he is also a ICAI certified IFRS professional, UGC NET Qualified, an Associate from Insurance Institute of India and completed 5 papers of Actuarial Science. He is also a visiting Faculty and Student Counsellor at Institute of Chartered Accountants of India, Kolkata and Secretary at ICAS, Kolkata

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