

CA – FOUNDATION – NOV'23 - GRAND TEST-1

FN23

Paper-3: Business Mathematics and StatisticsDate: 11th Dec 2023

Max. Marks: 100 Marks

Time Allowed – 180 min

1. ₹ 800 is invested at the end of each month in account paying interest 6% per year compounded monthly. What is the future value of annuity after 10th payment ? [Given that $(1.005)^{10} = 1.0511$]
- (a) ₹ 4444 (b) ₹ 8766 (c) ₹ 3491 (d) ₹ 8176

2. Below scatter diagram shows what type of correlation
- (a) Perfect negative correlation (b) Negative correlation
(c) Positive correlation (d) Perfect positive correlation

3. Four unbiased coins are tossed simultaneously. The expected number of heads is :

X:	0	1	2	3	4
P(x)	1/16	4/16	6/16	4/16	1/16

- (a) 1 (b) 2 (c) 3 (d) 4
4. if the inflexion points of a normal distribution are 6 and 14 . Find its Standard Deviation
(a) 4 (b) 6 (c) 10 (d) 12
5. If $\log_a \sqrt{3} = 1/6$, find the value of a:
(a) 9 (b) 81 (c) 27 (d) 3
6. Find the number of ways in which the letters of the word SOFTWARE be arranged such that all the vowels are always together?
(a) 720 (b) 1440 (c) 2880 (d) 4320
7. The cost of living index number in year 2015 and 2018 were 97.5 and 115 respectively. The salary of a worker in 2015 was 19500. How much additional salary was required for him in 2018 to maintain the same standard of living as in 2015?
(a) 3000 (b) 4000 (c) 3500 (d) 4500
8. In a Poisson distribution if $P(x=4) = P(x=5)$ then the parameter of Poisson distribution is:
(a) 4/5 (b) 5/4 (c) 4 (d) 5
9. The probability of a man hitting the target is 1/4. If he fires 7 times, the probability of hitting the target at least twice is :
(a) $1 - \left(\frac{5}{2}\right)^1 \left(\frac{3}{4}\right)^6$ (b) $1 - \left(\frac{15}{2}\right)^1 \left(\frac{3}{4}\right)^6$ (c) $1 - \left(\frac{5}{6}\right)^1 \left(\frac{3}{1}\right)^5$ (d) $1 - \left(\frac{5}{2}\right)^0 \left(\frac{3}{4}\right)^6$
10. If two regression coefficients are 4 and 16, the percentage of unexplained variation is
(a) 64 (b) 36 (c) 54 (d) 46
11. Mr. A invested ₹ x in an organisation, it amounts to ₹ 150 at 5% p.a. S.I. and to ₹ 100 at 3% p.a. S.I. Then the value of x is
(a) ₹ 70 (b) ₹ 40 (c) ₹ 25 (d) None of these
12. _____ satisfies circular test
(a) G.M. of price relatives or the weighted aggregate with fixed weights
(b) A.M. of price relatives or the weighted aggregate with fixed weights
(c) H.M. of price relatives or the weighted aggregate with fixed weights
(d) none
13. The average weight of 8 person increases by 1.5 kg, if a person weighing 65 kg replaced by a new person, what would be the weight of the new person?
(a) 76 kg (b) 80 kg (c) 77 kg (d) None of these
14. If X follows normal distribution with $\mu = 50$ and $\sigma = 10$, what is the value of $P(x \leq 60 / x > 50)$?
(a) 0.8413 (b) 0.6828 (c) 0.1587 (d) 0.7256
15. The mean and mode of the normal distribution
(a) may be equal (b) may be different (c) are always equal (d) (a) or (b)
16. Given that $\log_{10} x = m+n-1$ and $\log_{10} y = m-n$, the value of $\log_{10} \left(\frac{100x}{y^2}\right)$ expressed in the terms of m and n is

- (a) $1-m+3n$ (b) $m-1+3n$ (c) $m+3n+1$ (d) m^2-n^2
17. The 4th term of an A.P. is three times the first and the 7th term exceeds the third term by 1. Find the first term 'a' and common difference 'd'.
- (a) $a = 3, d=2$ (b) $a = 4, d=3$ (c) $a = 5, d=4$ (d) $a = 6, d=5$
18. The Standard Deviation of a set of 50 items is 10. Find the Standard Deviation if every item is increased by 5.
- (a) 15 (b) 5 (c) **10** (d) None of these
19. If there are 30 points in a plane of which 5 points are lies on the same line. Then the number of triangles can be formed ?
- (a) 650 (b) 580 (c) **4050** (d) 4060
20. ₹ 1,25,000 is borrowed at compound interest at the rate of 2% for the 1st year, 3% for the second year and 4% for the 3rd year. Find the amount to be paid after 3 years.
- (a) ₹ 125678 (b) ₹ 136587 (c) ₹ 163578 (d) ₹ **136578**
21. Coefficient of quartile deviation is $\frac{1}{4}$ then Q_3/Q_1 is
- (a) **$5/3$** (b) $4/3$ (c) $0\frac{3}{4}$ (d) $3/5$
22. In a certain language, '+' means father of, '-' means daughter of, '*' means son of, and '/' means mother of. For example, X+Y-Z means that X is the father of Y and Y is the daughter of Z.
A + F - K / G + L * H
How is H related to A?
- (a) Sister-in-law (b) **Daughter-in-Law** (c) Daughter (d) Grand-Daughter
23. A bag contains 4 Red and 5 Black balls. Another bag contains 5 Red and 3 Black balls. If one ball is drawn at random each bag. Then the probability that one Red and One Black is
- (a) $12/72$ (b) $25/72$ (c) **$37/72$** (d) $13/72$
24. XYZ Company has a policy for its recruitment as: It should not recruit more than eight men (x) to three women (y). How can this fact be expressed in inequality?
- (a) $3y \geq 8x$ (b) $3y \leq x/8$ (c) **$8y \geq 3x$** (d) $8y \leq 3x$
25. The Standard Deviation of Binomial distribution is:
- (a) npq (b) **\sqrt{npq}** (c) np (d) \sqrt{np}
26. The future value of an annuity of ₹ 5,000 is made annually for 8 years at interest rate of 9% compounded annually. [Given that $(1.09)^8 = 1.99256$]
- (a) ₹ **55,142.22** (b) ₹ 65,142.22 (c) ₹ 65,532.22 (d) ₹ 57,425.22
27. The Geometric mean of 3, 6, 24 and 48 is
- (a) 8 (b) **12** (c) 24 (d) 6
28. A is seated between D and F at a round table. C is seated opposite to D. E is round adjacent to D. Who sit opposite to B?
- (a) **A** (b) D (c) C (d) F
29. How many numbers of 3 digits can be made by using digits 3, 5, 6, 7 and 8. No digit being repeated.
- (a) 120 (b) **60** (c) 100 (d) None of these
30. If the common difference of an AP equals to the first term, then the ratio of its m^{th} term and n^{th} term is:
- (a) n:m (b) **m: n** (c) $m^2:n^2$ (d) None of these
31. Pointing to a man, a lady said "His mother is the only daughter of my mother". How is the lady related of the man?
- (a) **Mother** (b) Daughter (c) Sister (d) Aunt
32. The time required to produce a unit of product A is 3 hours and that for product B is 5 hours. The total available time is 220 hours. If x and y are the number of units of A and B that are produced then
- (a) $3x+2y=220$ (b) $3x+5y \geq 220, x \geq 0, y \geq 0$
(c) **$3x+5y \leq 220, x \geq 0, y \geq 0$** (d) $5x+2y \geq 220, x \geq 0, y \geq 0$
33. The quartile deviation of a normal distribution with mean 10 and standard deviation 4 is
- (a) 0.675. (b) 67.50. (c) **2.70** (d) 3.20.
34. In a joint family, there are father, mother, 3 married sons and one unmarried daughter. Out of the sons, two have two daughters each and one has a son only. How many female members are there in the family?
- (a) 3 (b) 6 (c) **9** (d) 5

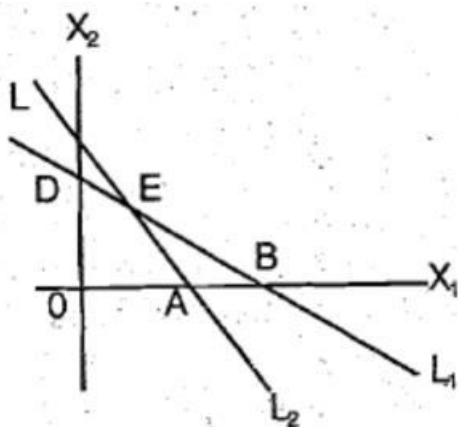
35. The equations of the two lines of regression are $4x + 3y + 7 = 0$ and $3x + 4y + 8 = 0$. Find the correlation coefficient between x and y .
 (a) **-0.75** (b) 0.25 (c) -0.92 (d) 1.25
36. Mr. A invested ₹ 20,000 every year for next 3 years at the interest rate of 8 percent per annum compounded annually. What is future value of the annuity? $(1.08)^3 = 1.2597$
 (a) 62644 (b) 62464 (c) **64928** (d) 63442
37. The 5th and 8th terms of a GP series is 27 and 729. Then find the 10th term.
 (a) 729 (b) **243** (c) 81683 (d) 6561
38. Find the odd one from the following:
 (a) Zebra (b) Giraffe (c) Horse (d) **Tiger**
39. When the mean is 3.57 and mode is 2.13, then the value of median is ____
 (a) **3.09** (b) 5.01 (c) 5.01 (d) none of these.
40. In a line, P is sitting 13th from left. Q is sitting 24th from the right and 3rd left from P, How many people are sitting in the line?
 (a) 34 (b) 31 (c) 32 (d) **33**
41. A person travels from A to B at the rate of 20 km/hr and from B to A at the rate of 30km/hr. What is the average rate of whole journey ?
 (a) 30 km/ hr. (b) **24 km/hr.** (c) 35 km/hr. (d) none of these
42. $5^{16} + 125^5$ is divisible by which of the following
 (a) 5 (b) **6** (c) 8 (d) 9
43. If the coefficient of correlation between two variables is 0.7 then the percentage of variation unaccounted for is
 (a) 70% (b) 30% (c) **51%** (d) 49%
44. The number of proper subsets of $A \cap B$, $A = \{1, 2, 3, 4, 5, 7, 8, 9, 10\}$ and $B = \{2, 4, 6, 7, 9\}$
 (a) **8** (b) 15 (c) 16 (d) 64
45. Probability of Ramesh & Deepak speaking truth is $1/4, 3/5$. Find the probability of at most one of them speaks truth.
 (a) 0.60 (b) **0.85** (c) 0.75 (d) None of these
46. Rita told mani, "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 Rita's friend?
 (a) **Cousin** (b) Daughter (c) Niece (d) Aunt
47. In a multiple choice question paper consisting of 100 questions of 1 mark each, a candidate gets 60% marks . If the candidate attempted all questions and there was a penalty of 0.25 marks for wrong answer, the difference between number of right answers and wrong answers is:
 (a) 32 (b) **36** (c) 40 (d) 38
48. 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%
49. A, P, R, X, S and Z are sitting in a row. S and Z are in the centre. A and P are at the ends. R is sitting to the left of A. Who is to the right of P?
 (a) A (b) **X** (c) S (d) Z
50. 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
51. Find the median of the following:

CI	0-10	10-20	20-30	30-40	40-50
F	5	15	28	10	2

- (a) 10.57 (b) **23.57** (c) 25 (d) None
52. If $f(y) = \frac{y-1}{y}$, find $f^{-1}(x)$,
 (a) $\frac{1}{1-y}$ (b) y (c) $\frac{y}{1-y}$ (d) $\frac{y}{y-1}$

53. Find odd man out of the following series 3,4, 10, 32, 136, 685,4116
 (a) 10 (b) **32** (c) 136 (d) 4116
54. X and Y are the children of A. A is the father of X but Y is not his son. How is Y related to A?
 (a) Son (b) **Daughter** (c) Sister (d) Brother
55. 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
56. For tabulation caption is
 (a) **The upper part of the table**
 (b) The lower part of the table
 (c) The main part of the table
 (d) The upper part of the table that describes the rows and sub-rows
57. A man is facing west. He turns 45° in the clockwise direction and then another 1800 in the same direction and then 270° in the anticlockwise direction. Find which direction he is facing now?
 (a) **South-East** (b) West (c) South (d) South-West
58. Find the present value of an ordinary annuity of 8 quarterly payments of ₹ 500 each, the rate of interest being 8% p.a. compound quarterly
 (a) 4275.00 (b) 4725.00 (c) **3662.50** (d) 3266.50
59. If the quartile deviation of a normal curve is 4.05, then its mean deviation is
 (a) 5.26 (b) 6.24 (c) 4.24 (d) **4.80**
60. Correlation analysis aims at
 (a) Predicting one variable for a given value of the other variable
 (b) Establishing relation between two variables
 (c) Measuring the extent of relation between two variables
 (d) **Both (b) and (c).**
61. 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
62. If α and β are the roots of the equation $x^2 + 7x + 12 = 0$, then the equation whose roots $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$ will be:
 (a) $x^2 - 14x + 49 = 0$ (b) $x^2 - 24x + 144 = 0$ (c) **$x^2 - 50x + 49 = 0$** (d) $x^2 - 19x + 144 = 0$
63. 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 Laspyre's Price Index Number is:
 (a) 118.13 (b) **107.14** (c) 120.10 (d) None of these
64. Ogive for more than type and less than type distributions intersect at
 (a) Means (b) **Median** (c) Mode (d) Origin
65. The time in by which a sum of money is 8 times of itself if it doubles itself in 15 years interest compounded annually.
 (a) 42 years (b) 43 years (c) **45 years** (d) 46 years
66. Ticket numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn bears a number which is multiple of 3 or 7?
 (a) 1/5 (b) **2/5** (c) 3/5 (d) None of these
67. If a is related to b if and only if the difference in a and b is an even integer, This relation is
 (a) symmetric, reflexive but not transitive (b) symmetric, transitive but not reflexive
 (c) reflexive, transitive but not symmetric (d) **equivalence relation**
68. If x and y are related as $3x + 4y = 20$ and the quartile deviation of x in 12. Then the Quartile deviation of y is:
 (a) 16 (b) 14 (c) 10 (d) **9**

69. Ram walks 30 km East then turns right and walks for another 16 km. He then again turns right and walks for another 16 km. He then turns left & walks for another 14 km. Then he turns right & walks for 14 km. How far is he from his initial point?
 (a) **26 km** (b) 24 km (c) 22 km (d) None of these
70. $\left(\frac{\sqrt{3}}{9}\right)^{5/2} \left(\frac{9}{3\sqrt{3}}\right)^{7/2} * 9$ is equal to :
 (a) **1** (b) $\sqrt{3}$ (c) $3\sqrt{3}$ (d) $\frac{3}{9\sqrt{3}}$
71. $\int \frac{6x+4}{(x-2)(x-3)} dx$ is equal to
 (a) $22 \log(x-3) - 16(x-2)$ (b) $11 \log(x-3) - 8(x-2)$
 (c) **$22 \log(x-3) - 16 \log(x-2)$** (d) $232 \log(x-3) + 16 \log(x-2)$
72. If a data collected from a census Report. What type of data it is :-
 (a) Time series data (b) Primary data (c) **Secondary data** (d) Geographical data
73. The population of a town increases every year by 2% of the population at the beginning of that year. The number of years by which the total increase of population be 40%
 (a) 15 years (b) **17 years** (c) 19 years (d) 20 years
74. The coefficient of Mean deviation about mean for the first 9 natural numbers?
 (a) 200/9 (b) 80 (c) **400/9** (d) 50
75. 105, 115.5, 150, 162.5, 203, ?
 (a) 217 (b) **217.5** (c) 210.5 (d) None of these
76. Probable Error can be obtained using Correlation coefficient as
 (a) **$0.675 * \frac{1-r^2}{\sqrt{N}}$** (b) $\frac{2}{3} * \frac{1+r^2}{\sqrt{N}}$ (c) $\frac{1+r^2}{N}$ (d) $\frac{1+r^2}{r^2}$
77. A ₹ 1000 bond paying annual dividends at 8.5% will be redeemed at par at the end of 10 years. Find the purchase price of this bond if the investor wishes a yield rate of 8%
 (a) ₹ 907.135 (b) **₹ 1033.54** (c) ₹ 945.67 (d) None of these
78. The common region represented by the following in equalities $L_1 = X_1 + X_2 < 4$; $L_2 = 2X_1 - X_2 > 6$



- (a) ABC (b) Outside of OAB (c) BCE (d) **ABE**
79. One evening before sunset Rekha and Hema were talking to each other face to face. If Hema's shadow was exactly to the right of Hema, which direction was Rekha facing?
 (a) North (b) **South** (c) West (d) East
80. Which of the following is not an example of continuous variable?
 (a) Temperature in India (b) Profit of Company X
 (c) **Number of road accidents** (d) A person's height
81. Mr. X lent some amount of money at 4% S.I. and he obtained ₹ 520 less than he lent in 5 years. The sum lent is
 (a) ₹ 620 (b) **₹ 650** (c) ₹ 750 (d) None of these

82. Find the next alphabet series in the given sequence? ALN, DNR, GPR?
 (a) KLN (b) **JRT** (c) RNU (d) RNV
83. The sum of the squares of deviations of a Set of observations has the smallest value. when the deviations are taken from their:
 (a) **A.M** (b) H.M (c) G.M (d) None of these
84. Suppose you decided to make a Systematic investment Plan (SIP) in a mutual fund with ₹ 1,00,000 every year from today for next 10 years at the rate of 10% per annum compounded annually. What is the future value of this annuity? Given $1.1^{10} = 2.59374$
 (a) ₹17,35,114 (b) ₹17,53,411 (c) ₹17,35411 (d) **₹ 17,53,114**
85. If South-West becomes North, then what will North-East be?
 (a) North (b) South-East (c) **South** (d) East
86. $\int_0^1 x e^x dx$ is equal to:
 (a) 0 (b) 2 (c) **1** (d) 3
87. The roots of equation $9^{x+2} - 6.3^{x+1} + 1 = 0$ are
 (a) **-2** (b) 2 (c) $\sqrt{2}$ (d) 0
88. 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
89. Five students are standing in a circle. Abhinav is between Alok and Ankur. Apurva is on the left of Abhishek. Alok is on the left of Apurva. Who is sitting next to Abhinav on his right?
 (a) Apurva (b) Ankur (c) Abhishek (d) **Alok**
90. The approximate ratio of SD, MD, QD is :
 (a) 3:4:5 (b) 2:3:4 (c) **15:12:10** (d) 5:6:7
91. Laspyres index number is a weighted aggregate method by taking _____ as weights.
 (a) **Quantity consumed in the base year** (b) Quantity consumed in the current year
 (c) Value of items consumed in base year (d) Value of items consumed in the current year
92. $\int (\log x)^2 dx$ is equal to:
 (a) **$x(\log x)^2 - 2x \log x + 2x + c$** (b) $x(\log x)^2 + 2x \log x + 2x + c$ (c) $x(\log x)^2 - 2x \log x - x + c$ (d) None
93. The pair of averages whose value can be determined graphically?
 (a) Mean and Median (b) Mode and Mean (c) **Mode and Median** (d) None of these
94. If Fisher's index = 150 and Paasche's Index = 144, then Laspeyre's index is _____
 (a) 147 (b) **156.25** (c) 104.17 (d) 138
95. There are 3 females A, B and E and 4 males C,D,F and G standing in a straight line. No two females are together. B is to right of c, F and D are not together as A is placed between them. G is not near B or E but E and F are together. Dis not to the right of B.
 Who are in the extreme ends?
 (a) **G and B** (b) C and F (c) B and D (d) None of these
96. Ravi made of an investment of ₹15,000 in a scheme and at the time of maturity the time of maturity the amount was ₹ 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
97. The speed of a train at a distance x (from the starting point) is given by $3x^2 - 5x + 4$. What is the rate of change (of distance) at $x=1$?
 (a) -1 (b) 0 (c) **1** (d) 2
98. In a certain code 'MENTION' is written as LNEITNO, how is PRESENT written in that code?
 (a) QFSFTUM (b) ONESEPP (c) QRESTNO (d) **OERESTN**
99. Origin is shifted by 5, what will happen
 (a) SD will increase by 5 (b) QD will increase by 5
 (c) MD will increase by 5 (d) **There will be no change in SD**
100. If $P = x^{1/3} + x^{-1/3}$ then $P^3 - 3P = ?$
 (a) 3 (b) $\frac{1}{2}(x + 1/x)$ (c) **$(x + 1/x)$** (d) $2(x + 1/x)$

** ** ALL THE BEST ** **

KEY

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