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TEST-6

QUESTION BOOKLET CODE: MKG

QUESTION PAPER BOOKLET NO. 6042022

CA FOUNDATION

(24-04-2022 3:00 P.M. TO 5:00 P.M)

Business Mathematics and Logical Reasoning & Statistics

FULL SYLLABUS

Time allowed: 2 hours **Maximum Marks : 100**

Instructions:

1. Answer to be given in OMR sheet
2. Negative marking applies

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1. P, Q and R are three cities. The ratio of average temperature between P and Q is 11 : 12 and that between P and R is 9 : 8. The ratio between the average temperature of Q and R is :

(a) 22 : 27
(b) 27 : 22
(c) 32 : 33
(d) None of these

2. If $\frac{x}{b+c-a} = \frac{y}{c+a-b} = \frac{z}{a+b-c}$ then $(b-c)x + (c-a)y + (a-b)z$ is:

(a) 1
(b) 0
(c) 5
(d) None of these

3. Show that $\left(\frac{X^b}{X^c}\right)^a \times \left(\frac{X^c}{X^a}\right)^b \times \left(\frac{X^a}{X^b}\right)^c$ reduce to:

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

4. $\frac{1}{1+\log_a(bc)}+\frac{1}{1+\log_b(ca)}+\frac{1}{1+\log_c(ab)}$ is equal to:

(a) 0

(b) 1

(c) 3

(d) -1

5. Y is older than x by 7 years 15 years back X's age was 3/4 of Y's age. Their present ages are :

(a) (X = 36, Y = 43)

(b) (X = 50, Y = 43)

(c) (X = 43, Y = 50)

(d) (X = 40, Y = 47)

6. The value of $2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\ldots\ldots\ldots\ldots\ldots\infty}}}}$

(a) $1+\sqrt{2}$

(b) $1\pm\sqrt{5}$

(c) $1\pm\sqrt{2}$

(d) None of these

7. An automobile company manufactures two cars A and B, Model A requires 15 man - hours for assembly; 5 man - hours for painting and finishing and 1 man - hours for checking testing. Model B requires 6 man - hours for assembly; 4 man - hours for painting and finishing and 2 man - hours for checking and testing. There are 400 man - hours in assembly shop; 150 man - hours in painting and finishing shop and 40 man - hours are available in checking and testing division. Express this using linear inequalities:

(a) 15x + 6y ≤ 400
5x + 4y ≤ 150
x + 2y ≤ 40
x ≥ 0; y ≥ 0

(b) 15x + 6y ≥ 400
5x + 4y ≥ 150
x + 2y ≥ 40
x ≥ 0; y ≥ 0

(c) 6x + 15y ≤ 400
6x + 5y ≤ 150
x + 2y ≥ 40
x ≥ 0; y ≥ 0

(d) None of these

8. A person borrows Rs. 5000 for 2 years at 4% p.a. simple interest. He immediately lends to another person at 6.33% pa. for 2 years. Find the gain in the transaction per year.

(a) Rs. 112.50

(b) Rs. 125

(c) Rs. 225

(d) Rs. 116.50

9. Paul borrowers Rs. 20,000 on condition to repay it with compound interest at 5% p.a. in annual instalment of Rs. 2.000 each. Find the number of years in which the debt would be paid off:

(a) 10 years

(b) 12 years

(c) 14 years

(d) 15 years

10. Six boys and five girls are to be seated in a row such that no two girls and no two boys sit together. Find the number of ways in which this can be done.
(a) 86400
(b) 85000
(c) 85400
(d) None of these

11. A committee of 3 ladies and 4 gents is to be formed out of 8 ladies and 7 gents. Mrs. X refuse to serve in a committee in which Mr. Y is a member. The number of such committees is :
(a) 1530
(b) 1500
(c) 1520
(d) 1540

12. On 1st January every year a person buys National Saving Certificates of value exceeding that of his last years purchase by Rs. 100. After 10 years he finds that the total value of the certificates purchased by him is Rs. 54,500. Find the value of certificates purchased by him in the first year:
(a) Rs. 6,000
(b) Rs. 4,000
(c) Rs. 5,000
(d) Rs. 5,500

13. The sum of the first eight terms of a GP. is five times the sum of the first four terms; then the common ratio is:
(a) $\sqrt{2}$
(b) $-\sqrt{2}$
(c) $\pm \sqrt{2}$
(d) None of these

14. (A∩B)' is equal to:
(a) (A'∩B)'
(b) A'UB'
(c) A'∩B'
(d) None of these

15. f (x) = 3 + x, for - 3 < x < 0 and 3 - 2x for 0 < x < 3, then value of f (2) will be
(a) -1
(b) 1
(c) 3
(d) 5

16. $\int 2^{3x}.5^{x}.3^{2x}\,dx =$
(a) $\frac{2^{3x}.3^{2x}.5^{x}}{\log 720}$ + c
(b) $\frac{2^{3x}.3^{2x}.5^{x}}{\log 360}$ + c
(c) $\frac{2^{3x}.3^{2x}.5^{x}}{\log 90}$ + c
(d) $\frac{2^{3x}.3^{2x}.5^{x}}{\log 180}$ + c

17. If $4x^3 + 8x^2 – x – 2 = 0$ then value of 2x – 3:
(a) -4, 2, -7
(b) -4, -2, -7
(c) 4, 2, 7
(d) $-\frac{1}{2}, \frac{1}{2}$ -2

18. If ${}^nP_r = {}^nP_{r+1}$ and ${}^nC_r = {}^nC_{r-1}$ then find the value of n
(a) 2
(b) 3
(c) 4
(d) 5

19. "Is parallel to" over the set of straight line in a given plane is:
(a) Reflexive
(b) Symmetric
(c) Transitive
(d) Equivalence

20. The students of two classes were in the ratio 5 : 7, if 10 students left from each class, the remaining students are in the ration of 4 : 6 then now the number of students in each class is:
(a) 30, 40
(b) 25, 24.
(c) 40, 60.
(d) 50, 70

21. In what ratio should tea worth Rs.10 per kg be mix with tea worth Rs. 14 per kg, so that the average prices of the mixture may be Rs. 11 per kg?
(a) 2 : 1
(b) 3 : 1
(c) 3 : 2
(d) 4 : 3

22. $\left(\frac{\sqrt{3}}{9}\right)^{5/2}\left(\frac{9}{3\sqrt{3}}\right)^{7/2}$ x 9 is equal to:
(a) 1
(b) $\sqrt{3}$
(c) $3\sqrt{3}$
(d) $\frac{3}{9\sqrt{3}}$

23. log 144 is equal to:
(a) 2 log 4 + 2 log 2
(b) 4 log 2 + 2 log 3
(c) 3 log 2 + 4 log 3
(d) 3 log 2 x 4 log 3

24. Ten years ago, the age of a father was four times of his son. Ten years hence the age of the father will be twice that of his son. The present ages of the father and the son are:
(a) (50, 20)
(b) (60, 20)
(c) (55, 25)
(d) None of these

25. The condition that one root of $ax^2 + bx + c = 0$ may be the double the other is :
(a) $b^2 = 2ac$
(b) $b^2 = 3ac$
(c) $2b^2 = 9ac$
(d) $2b^2 = 3ac$

26. If $\left|\frac{3x-4}{4}\right| \leq \frac{5}{12}$, the solution set is:
(a) $\left\{x: \frac{19}{18} \leq x \leq \frac{29}{18}\right\}$
(b) $\left\{x: \frac{7}{9} \leq x \leq \frac{17}{9}\right\}$
(c) $\left\{x: \frac{29}{18} \leq x \leq \frac{19}{18}\right\}$

(d) None of the above

27. A man deposits Rs. 2,000 in a bank at 4% per annum and Rs. 3,000 in UTI at 14% per annum. Find the rate of interest for the whole sum.

(a) 10%
(b) 5%
(c) 15%
(d) None of these

28. Find the number of arrangements in which the letters of the word 'MONDAY' be arrangement so that the words thus formed begin with 'M" and do not end with 'N'.

(a) 720
(b) 120
(c) 96
(d) None of these

29. ${}^nC_1 + {}^nC_2 + {}^nC_3 + {}^nC_4 + \ldots\ldots + {}^nC_n$ equals:

(a) 2^n-1
(b) 2^n
(c) 2^n+1
(d) None of these

30. 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 these

31. In a finite G.P., the product of two terms equal distant from the beginning and from the end is equal to the product of the first and the last term of the G.P. This statement is

(a) True
(b) False
(c) Cannot say
(d) None of these

32. The sets V = $\{\frac{x}{x} + 2 = 0\}$, R = $\{\frac{x}{x^2} + 2x = 0\}$ and S = $\{x : x^2 + x - 2 = 0\}$ are equal to one another if x is equal to :

(a) - 2
(b) 2
(c) 1/2
(d) None of these

33. If f : R→R,f(x) = $2x + 7$, then the inverse of f is:

(a) $f^{-1}(x) = \frac{(x-7)}{2}$
(b) $f^{-1}(x) = \frac{(x+7)}{2}$
(c) $f^{-1}(x) = \frac{(x-3)}{2}$
(d) None of these

34. Differentiate x^x w.r.t.x

(a) X^x (1+ log x)
(b) X^x log ex
(c) Both (a) & (b)
(d) None of these

35. $\int \log x \, dx$ is equal to
(a) x log x
(b) x log x x^2 + k
(c) x log x + k
(d) None of these

36. The first term of an A.P. is 14 and the sums of the first five terms and the first ten terms are equal in magnitude but opposite in sign. The 3rd term of the AP is:
(a) $6\frac{4}{11}$
(b) 6
(c) $\frac{4}{11}$
(d) None of these

37. There are 4 letters and 4 addressed envelopes corresponding to them. The number of ways (i) all letters are in the right envelopes is (ii) at least one letter is in wrong envelopes is :
(a) 24, 1
(b) 9, 15
(c) 1, 23
(d) None of these

38. If the cost of function of a commodity is given by C = 150x – $5x^2$ + $\frac{x^3}{6}$, where C stand 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

39. 1, 2, 3, 14, 5, 34, 7, ?, ?
(a) 68, 7
(b) 63, 9
(c) 60, 11
(d) 62, 9

40. 3, 8, 18, 35, ?, 98:
(a) 61
(b) 71
(c) 41
(d) 51

41. If H = 8 and HAT = 29, find how much BOX =?
(a) 46
(b) 43
(c) 42
(d) 41

42. If HEROISM is coded as SVILRHN, then how will ALP be coded as?
(a) LTV
(b) ZSX
(c) SGD
(d) ZOK

43. Rama is standing at a point facing north. He walks 10 km straight, turns left and walks another 15 km straight and finally turns left and walks 10 km. How far is he from the starting point now?
(a) 10 km.
(b) 5 km

(c) 12 km
(d) 15 km

44. 'X' is in the East of 'Y' which is in the North of 'Z' If 'P' is the East of 'Z' then in which direction of 'X', is 'P':
(a) South – west
(b) South – East
(c) South
(d) West

45. Going 40 m to the south of his house, Ramdev turns left and goes another 10 m. Then turning to the North, he goes 20 m and then starts walking to his house. In which direction is he walking now?
(a) North – west
(b) South – East
(c) South – East
(d) South – west

46. A person facing North 70^{o} clock wise direction moving in clockwise and 300^{o} clock wise direction. Now, in which direction he presently facing.
(a) North – West
(b) South – East
(c) North – East
(d) South – west

47. Introducing Asha to guests, Bhaskar said, "Her father is the only son of my father." How is Asha related to Bhaskar?
(a) Niece
(b) Grand-daughter
(c) Mother
(d) Daughter

48. Karan has a brother 'Prem' and a sister 'Neesha'. Karan's wife is 'Naj' and has a daughter 'Naksha'. Naksha got married with Neesha's son akbar and has a baby girl 'Riya' . What is relation between 'Naksha' and 'Neesha'?
(a) Sister
(b) Niece and Aunt
(c) Mother and Daughter
(d) Mother and Grand daughter

49. If 'A + B' means 'A' is father of 'B', 'A–B' means 'A is mother of B', A*B means 'A is brother of B' and 'A%B' means 'A is sister of B' then how is Q related to S in 'P + Q *R–S' ?
(a) Husband
(b) Uncle
(c) Brother
(d) Father

50. Pointing towards a man, Ritika said "He is the son of my grandfather's only son", How is Ritika related to that man?
(a) Aunt
(b) Sister
(c) Mother
(d) Wife

51. Umesh is taller than Satish, Suresh is shorter than Neeraj but taller than Umesh. Who is the tallest among them?
(a) Umesh
(b) Suresh

(c) Satish
(d) Neeraj

52. Six girls are standing in such a way that they from a circle, facing the centre. Subbu is to the left of Pappu, Revathi is between Subbu and Nisha. Aruna is between pappu and Keerthana. Who is to the right of Pappu.
(a) Subbu
(b) Keerthana
(c) Nisha
(d) Aruna

53. Seven persons A, B, C, D, E, F and G are standing in a Straight line.
D is to the right of G.
C is between A and B.
E is between F and D.
There are three persons between G and B.
Who is on the extreme left?
(a) G
(b) A
(c) B
(d) D

54. Five students are standing one behind the other in the play ground facing the instructor. Malini is behind Anjana, but in front of Gayathri. Meena is in front of Sheena, but behind Gayathri. What is position of Meena?
(a) Second from last
(b) Extreme first
(c) Extreme last
(d) Second from first

55. Which of the following is correct?
(a) 3(Mean – Median) = Mean – Mode
(b) Mean – Median = 3 (Mean – Median)
(c) Mean – Median = 2 (Mean – Mode)
(d) Mean – Mode = 2 (Mean – Median)

56. GM = 6, AM = 6.5 then HM =
(a) $\frac{6^2}{6.5}$
(b) $\frac{6}{6.5}$
(c) $\frac{6.5}{6}$
(d) None of these

57. Coefficient of correlation between X & Y is 0.6. If both X and Y are multiplied by -1. Then resultant coefficient of correlation is:
(a) 0.6
(b) -0.6
(c) 1/0.6
(d) None of these

58. Correlation between temperature and power consumption is:
(a) Positive
(b) Negative
(c) Zero
(d) None of these

59. Fisher's index number does not satisfy:
(a) Unit test
(b) Circle test
(c) Time reversal test
(d) Factor reversal test

60. If the two regression lines are x + y = 1 and x – y = 1 then mean of x and y are:
(a) 1, 0
(b) 0, 1
(c) 1, 1
(d) None of these

61. Frequency density corresponding to a class interval is the ratio of _____:
(a) Class frequency to the class length
(b) Class frequency to the total frequency
(c) Class length to the class frequency
(d) Class frequency to the cumulative frequency

62. The intersection points of less than ogive and more than ogive gives:
(a) Mean
(b) Mode
(c) Median
(d) None of these

63. For any two events A and B:
(a) P (A – B) = P (A) – P(B)
(b) P (A – B) = P (A) – P(A ∩ B)
(c) P (A – B) = P (B) – P(A ∩ B)
(d) P (B – A) = P (B) + P(A ∩ B)

64. If P(A) = $\frac{2}{3}$, P(B) = $\frac{1}{4}$, P(A ∩ B) = $\frac{1}{12}$ then P $\left(\frac{B}{A}\right)$ = _____:
(a) $\frac{1}{8}$
(b) $\frac{7}{8}$
(c) $\frac{8}{7}$
(d) None of these

65. In Binomial distribution, if variance = mean^2 then n & p are:
(a) 1, $\frac{1}{2}$
(b) 1, 1
(c) 2, $\frac{1}{2}$
(d) 3, $\frac{1}{2}$

66. In _____ distribution, mean = variance:
(a) Binomial
(b) Poisson
(c) Normal
(d) None of these

67. If X ~ N (50, 16) then which of the following is not possible:
(a) P (X > 60) = 0.30
(b) P (X < 50) = 0.50
(c) P (X < 60) = 0.40
(d) P (X > 50) = 0.50

68. Data collected on religion from the census reports are:
(a) Primary data
(b) Secondary data
(c) Sample data
(d) (a) or (b)

69. The two lines of regression become identical when:
(a) $r = 1$
(b) $r = -1$
(c) $r = 0$
(d) (a) or (b)

70. If P(A) = 2/3, P(B) = 3/5, P(A U B) = 5/6 then P(A/B') is:
(a) $\frac{7}{12}$
(b) $\frac{5}{12}$
(c) $\frac{1}{4}$
(d) (a) or (b)

71. The normal curve is:
(a) Positively skewed
(b) Negatively skewed
(c) Symmetrical
(d) All these

72. Purchasing power of money is:
(a) Reciprocal of price index number
(b) Equal to price index number
(c) Unequal to price index number
(d) None of these

73. In the year 2010 the monthly salary was Rs.24,000. The consumer price index number was 140 in the year 2010 which rises to 224 in the year 2016. If he has to be rightly compensated what additional monthly salary to be paid to him:
(a) ₹ 14,400
(b) ₹ 38,400
(c) ₹ 7,200
(d) None of these

74. In how many cases 4 or more accidents occur?

No. of accidents	0	1	2	3	4	5	6	7
Frequency	12	9	11	13	8	9	6	3

(a) 32
(b) 41
(c) 26
(d) 18

75. The two regression lines are:
16x – 20y + 132 =0 and 80x -30y – 428 = 0, the value of correlation coefficient is
(a) 0.6
(b) -0.6
(c) 0.54
(d) 0.45

76. If with a rise of 10% in prices the wages are increased by 20% the real wage increases by:
(a) 10%
(b) More than 10%
(c) 20%
(d) Less than 10%

77. 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

78. 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

79. 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

80. 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

81. 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

82. 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

83. 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

84. 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) $\frac{1}{16}$

85. 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) $\frac{3}{11}$

86. If for a normal distribution Q1= 54.52 and Q3 = 78.86, then the median of the distribution is

(a) 12.17

(b) 66.69

(c) 39.43

(d) None of these

87. 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 these

88. 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) $\frac{16}{25}$

89. Coefficient of quartile deviation is $\frac{1}{4}$ then Q_3/Q_1 is

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

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

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

(d) $\frac{3}{5}$

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

(a) 0.6745

(b) 0.06745

(c) 0.5287

(d) None of the above

91. 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

92. The ratio of the earnings of two persons 3:2. If each saves $\frac{1}{5}$th of their earnings, the ratio of their savings.
(a) 2:3
(b) 3:2
(c) 4:5
(d) 5:4

93. The Third Proportional to 15 and 20 is
(a) 80/3
(b) 80
(c) 80/7
(d) 120

94. If $\log_9 x + \log_3 x = \frac{3}{2}$ then x is
(a) 0
(b) 1
(c) 94
(d) 3

95. If $x + y, y + z, z + x$ are in the ratio 6 : 7 : 8 and $x + y + z = 14$ then the value of x is
(a) 6
(b) 7
(c) 8
(d) 10

96. 5 chairs and 3 tables cost of Rs.350. and 3 Chairs and 5 tables cost Rs.370. What is the cost of the table and two chairs?
(a) Rs.130
(b) Rs. 120
(c) Rs.150
(d) Rs.140

97. If one root of the quadratic equation is $2 + \sqrt{3}$, the equation is _____
(a) $x^2 - 4x + 1 = 0$
(b) $x^2 + 4x + 1 = 0$
(c) $x^2 + 4x - 1 = 0$
(d) None of these

98. If thrice of A's age 6 years ago be subtracted from twice his present age, the result would be equal to his present age. Find A's Age
(a) 9
(b) 8
(c) 10
(d) 12

99. The solution set of the in equation x +2 > 0 and 2x – 6 > 0 is
(a) $(-2, \infty)$
(b) $(3, \infty)$
(c) $(-\infty, 2)$
(d) $(-\infty, -2)$

100. A company produces two products A and B, each of which requires processing in two machines. The first machine can be used at most for 60 hours, the second machine can be used at most for 40 hours. The product A requires 2 hours on machine one and one hour on machine two. The product B requires one hour on machine one and two hours on machine two. Express above situation using linear inequalities.

(a) $2x + y \leq 60$ and $x + 2y \geq 40$.
(b) $2x + y \geq 60$ and $x + 2y \geq 40$.
(c) $2x + y \leq 60$ and $x + 2y \leq 40$.
(d) $2x + y \geq 60$ and $x + 2y \leq 40$.

SPACE FOR ROUGH WORK