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TEST-4

QUESTION BOOKLET CODE: MKG

QUESTION PAPER BOOKLET NO. 4022022

CA FOUNDATION

(13-02-2022 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. If there are 3 observations 15, 20, 25 then the sum of deviation of the observations from their AM is
 - (a) 0
 - (b) 5
 - (c) -5
 - (d) 10
2. For any two dependent event A and B, $P(A) = 5/9$ and $P(B) = 6/11$ and $P(A \cap B) = 10/33$. What are the value of $P(A/B)$ and $P(B/A)$?
 - (a) $5/9, 6/11$
 - (b) $5/6, 6/11$
 - (c) $1/9, 2/9$
 - (d) $2/9, 4/9$
3. If the AM and GM for 10 observations are both 15, then the value of HM is
 - (a) Less than 15
 - (b) More than 15
 - (c) 15
 - (d) Cannot be determined

4. The average number of advertisements per page appearing in a newspaper is 3. What is the probability that in a particular page zero number of advertisement are there?
- e^{-3}
 - e^0
 - e^{+3}
 - e^{-1}
5. Six children, named as P, Q, R, S, T and U, are sitting in a row. Q is between U and S; T is between P and R; P does not sit next to either U or S, R does not sit next to S. So, U is sitting between the pairs _____ of childrens
- Q and T
 - Q and R
 - Q and S
 - Q and P
6. Five persons A, B, C, D and E are sitting in a row. A sits left to C and C sits left to B. E sits right to B, D sits in between E and B. who is sitting in the middle?
- B
 - C
 - E
 - D
7. Four ladies A, B, C and D and four Gentlemen E, F, G and H are sitting in a circle around a table facing each other.
- No two ladies or gentlemen are sitting side by side
 - C, who is sitting between G and E, facing D.
 - F is between D and A and facing G.
 - H is to the right of B
- Who is immediate neighbour of B?
- G and H
 - E and F
 - E and G
 - A and B
8. Persons M, N, O, P, Q, P, S and T are sitting on a compound wall facing North. O sits fourth left of S; P sits second to the right of S, only two people sit between P and M; N and R are immediate neighbours of each other. N is not an immediate neighbour of M; T is not a neighbour of P. How many persons are seated between M and Q?
- One
 - Two
 - Three
 - Four
9. 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?
- 34
 - 31
 - 32
 - 33
10. The number of four letter words can be formed using the letters of the word DECTIONARY is
- 5040
 - 720
 - 90
 - 30240

11. The number of words that can be formed using the letters of "PETROL" such that the words do not have "P" in the first position is
- 720
 - 120
 - 600
 - 540
12. If the sum and product of three numbers in G.P. are 7 and 8 respectively, then 4th term of the series is
- 6
 - 4
 - 8
 - 16
13. Mr. X wants to accumulate ₹ 50,00,000 at the end of 10 year. Then how much amount is required to be invested every year if interest is compounded annually at 10%? (Given that $P(10,0.10) = 15.9374208$)
- ₹ 3,13,726.87
 - ₹ 4,13,726.87
 - ₹ 3,53,726.87
 - ₹ 4,53,726.87
14. if ${}^n P_2 = 12$, then the value of n is
- 2
 - 3
 - 4
 - 6
15. The number of different ways the letters of the word "DETAIL" can be arranged in such a way that the vowels can occupy only the odd position is
- 32
 - 36
 - 48
 - 60
16. Let $a = \frac{(\sqrt{5}+\sqrt{3})}{(\sqrt{5}-\sqrt{3})}$ and $b = \frac{(\sqrt{5}-\sqrt{3})}{(\sqrt{5}+\sqrt{3})}$. What is the value of $a^2 + b^2$?
- 64
 - 62
 - 60
 - 254
17. Income of R and S are in the ratio 7 : 9 and their expenditures are in the ratio 4 : 5. Their total expenditure is equal to income of R. what is the ratio of their savings?
- 23:36
 - 28:41
 - 31:43
 - 35:46
18. A bag has 105 coins containing some 50 paise, and 25 paise coins. The ratio of the number of these coins is 4 : 3. The total value of (in ₹) in the bag is
- 43.25
 - 41.25
 - 39.25
 - 35.25

19. If $\log_{10}3=x$ and $\log_{10}4 = y$, then the value of $\log_{10}120$ can be expressed as
- $x - y + 1$
 - $x + y + 1$
 - $x + y - 1$
 - $2x + y - 1$
20. XYZ Company have 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?
- $3y \geq 8x$
 - $3y \leq \frac{x}{8}$
 - $8y \geq 3x$
 - $8y \leq 3x$
21. Find the value of $(\log x^6)$ if $\log(x) + 2 \log(x^2) + 3 \log(x^3) = 14$.
- 3
 - 4
 - 5
 - 6
22. Which of the following pair of events E and F are mutually exclusive?
- $E = \{\text{Ram's age is 13}\}$ and $F = \{\text{Ram is studying in a college}\}$
 - $E = \{\text{Sita studies in a school}\}$ and $F = \{\text{Sita is a play back singer}\}$
 - $E = \{\text{Raju is an elder brother in a family}\}$ and $F = \{\text{Raju's father has more than one son}\}$
 - $E = \{\text{Banu studied B.A. English literature}\}$ and $F = \{\text{Banu can read English novels}\}$
23. Four unbiased coins are tossed simultaneously. The expected number of heads is:
- 1
 - 2
 - 3
 - 4
24. If, for a Poisson distributed random variable X, the probability for X taking value 2 is 3 times the probability for X taking value 4, then the variable of X is
- 4
 - 3
 - 2
 - 5
25. Assume that the probability for rain on a day is 0.4. An umbrella salesman can earn ₹ 400 per day in case of rain on that day and will lose ₹ 100 per day if there is no rain. The expected earnings (in ₹) per day of the salesman is
- 400
 - 200
 - 100
 - 0
26. Let X be normal distribution with mean 2.5 and variance 1. If $P[a < X < 2.5] = 0.4772$ and that the cumulative normal probability value at 2 is 0.9772, then $a = ?$
- 1.5
 - 3
 - 3.5
 - 4.5

27. D is daughter of E. A is son of D. C is a brother of A and B is sister of A. F is brother of D. How F is related to B?
- Father-in-law
 - Uncle
 - Brother
 - Mother-in-law
28. Introducing a boy a girl said, "He is the son of the daughter of the father of my uncle". Who is the boy to the girl?
- Brother
 - Nephew
 - Uncle
 - Son-in-law
29. It is given that "A is the mother of B; B is the sister of C; C is the father of D". How is A related to D?
- Mother
 - Grandfather
 - Aunt
 - Sister
30. R told to M as, "the girl, I met at the beach was the youngest daughter of the brother-in-law of my friend's mother". How is the girl related to R's friends?
- Cousin
 - Daughter
 - Niece
 - 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 and U. Q the lawyer is married to P. P has one son of 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 the granddaughter of a family?
- She is a lawyer
 - She is an engineer
 - She is a student
 - She is a doctor
32. A National Institute arrange its students data in accordance with different states. This arrangement of data is known as
- Temporal Data
 - Geographical Data
 - Ordinal Data
 - Cardinal Data
33. The sum of series $7+14+21+\dots$ To 17th term is:
- 1071
 - 971
 - 1171
 - 1271
34. Out of a group of 20 teachers in a school, 10 teach Mathematics, 9 teach Physics and 7 teach Chemistry, 4 teach Mathematics and Physics but none teach both Mathematics and Chemistry. How many teach Chemistry and Physics; how many teach only Physics?
- 2, 3
 - 3, 2
 - 4, 6
 - 6, 4

35. The sum of first n terms of an AP is $3n^2+5n$. The series is:
 (a) 8, 14, 20, 26,
 (b) 8, 22, 42, 68,
 (c) 22, 678, 114,
 (d) 8, 14, 28, 44,
36. The largest value of n for which $\frac{1}{2} + \frac{1}{2^2} + \dots + \frac{1}{2^n} < 0.998$ is _____.
 (a) 9
 (b) 6
 (c) 7
 (d) 8
37. 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) Transitive, reflexive but not symmetric
 (d) Equivalence relation
38. If one root is half of the other of a quadratic equation and the difference in roots is a , then the equation is
 (a) $x^2+ax + 2a^2= 0$
 (b) $x^2-3ax - 2a^2= 0$
 (c) $x^2-3ax + 2a^2= 0$
 (d) $x^2+3ax - 2a^2= 0$
39. The value of $\frac{6^{n+1} + 3^{n+2} \times 2^{n+3}}{5 \times 6^n + 6^n}$ is.
 (a) 13
 (b) 10
 (c) 9
 (d) 8
40. In a department, the number of males and females are in the ratio 3:2. If two males and 5 females join department, then the ratio becomes 1 : 1, initially the number of female in the department is
 (a) 9
 (b) 6
 (c) 3
 (d) 8
41. If $\frac{(3a)^{2x-4}}{2b} = \frac{(2b)^{2x-4}}{3a}$ for some a and b , then the value of x is
 (a) 8
 (b) 6
 (c) 4
 (d) 2
42. In a multiple choice question paper consisting of 100 questions of 1 marks each, a candidate get 60% marks. If the candidate attempted all question 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
43. The probability distribution of a random variable x is give below:

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

What is the standard deviation of x ?

- (a) 1.49
 - (b) 1.56
 - (c) 1.69
 - (d) 1.72
44. The manufacturer of a certain electronic component is certain that 2% of his product is defective. He sells the components in boxes of 120 and guarantees that not more than 2% in any box will be defective. Find the probability that a box, selected at random, would fail to meet the guarantee?
(Given that $e^{-2.4} = 0.0907$)
- (a) 0.49
 - (b) 0.39
 - (c) 0.37
 - (d) 0.43
45. In a group of 20 males and 15 females 12 males and 8 females are services holders. What is the probability that a person selected at random from the group is a services holder given that the selected person is a male?
- (a) 0.40
 - (b) 0.60
 - (c) 0.45
 - (d) 0.55
46. There are 3 boxes with the following composition:
Box I : 7 Red + 5 White + 4 Blue balls
Box II : 5 Red + 6 White + 3 Blue balls
Box III : 4 Red + 3 White + 2 Blue balls
One of the boxes is selected at random and a ball is drawn from it.
What is the probability the drawn is red?
- (a) $1249/3024$
 - (b) $1247/3004$
 - (c) $1147/3024$
 - (d) $1/2$
47. A student marks in five subject S1, S2, S3, S4 and S5 are 86, 79, 90, 88 and 89. If we need to draw a Pie chart to represent these marks, then what will be the Central angle for S3?
- (a) 103.2°
 - (b) 75°
 - (c) 105.6°
 - (d) 94.8°
48. If average mark for a group of 30 girls is 80, a group of boys is 70 and combined average is 76, then how many are in the boy's group?
- (a) 21
 - (b) 20
 - (c) 22
 - (d) 19
49. If two variable a and b are related by $c = ab$ then G.M of c is equal to
- (a) G.M. of $a +$ GM. of b
 - (b) G.M. of $a \times$ G.M. of b
 - (c) G.M. of $a -$ G.M. of b
 - (d) G.M. of $a /$ G.M. of b

50. For a moderately skewed distribution, the median is twice the mean, then the mode is _____ times the median.
- 3
 - 2
 - $2/3$
 - $3/2$
51. The median value of the set of observations 48, 36, 72, 87, 19, 66, 56, 91 is
- 53
 - 87
 - 61
 - 19
52. The marks secured by 5 students in a subject are 82, 73, 69, 84, 66. What is the coefficient of Range
- 0.12
 - 12
 - 120
 - 0.012
53. If $u(x) = \frac{1}{1-x}$, then $u^{-1}(x)$ is:
- $\frac{1}{x-1}$
 - $1-x$
 - $1-\frac{1}{x}$
 - $\frac{1}{x} - 1$
54. The cost for producing x units is $500 - 20x^2 + x^3/3$. The marginal cost is minimum at $x =$ _____.
- 5
 - 10
 - 20
 - 50
55. If $y = \frac{x^4}{e^x}$ then $\frac{dy}{dx}$ is equal to:
- $\frac{x^3(4-x)}{(e^x)^2}$
 - $\frac{x^3(4-x)}{e^x}$
 - $\frac{x^2(4-x)}{e^x}$
 - $\frac{x^3(4-1)}{e^x}$
56. 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 $x = 1$?
- 1
 - 0
 - 1
 - 2
57. If the square of a number exceeds twice of the number by 15, then number that satisfies the condition is
- 5
 - 3
 - 5
 - 15

58. The value of $\left(1 - \sqrt[3]{0.027} \left(\frac{5}{6}\right) \left(\frac{1}{2}\right)^2\right)$ is:
- 11/16
 - 13/16
 - 15/16
 - 1
59. If the data points of (X, Y) series on a scatter diagram lie along a straight line that goes downwards as X values move from left to right, then the data exhibit ___ correlation
- Direct
 - Imperfect indirect
 - Inverse
 - Imperfect direct
60. A renowned hospital usually admits 200 patients everyday, One percent patients, on an average, require special room facilities. On one particular morning, it was found that only one special room is available. What is the probability that more than 3 patients would require special room facilities?
- 0.1428
 - 0.1732
 - 0.2235
 - 0.3450
61. For any two variable x and y the regression equations are as $2x + 5y - 9 = 0$ and $3x - y - 5 = 0$. What are the A.M. of x and y?
- 2, 1
 - 1, 2
 - 4, 2
 - 2, 4
62. The intersecting point of two regression lines at X-axis. If the mean of X-value is 16, the standard deviations of X and Y are respectively, 3 and 4, then the mean of Y-value is
- 16/3
 - 4
 - 0
 - 1
63. The regression coefficients remain unchanged due to
- Shift of origin
 - Shift of scale
 - Always
 - Never
64. For a probability distribution, probability is given by, $P(X_i) = \frac{x_i}{k}$, $X_i = 1, 2, \dots, 9$.
The value of k is:
- 55
 - 9
 - 45
 - 81
65. For a data having odd number of value, the difference between the first and the middle value is equal to the difference between the last and the middle value; similarly, the difference between the second and middle values is equal to that of second last and middle value so on. Therefore, the middle value is equal to
- Half of the range
 - Half of standard deviation
 - Mode

- (d) Mean
66. One hundred participants expressed their opinion in recommending a new product to their friends using the attributes; most unlikely, unlikely, not sure, likely, most likely. The appropriate measure of central tendency that can be used here is
- (a) Mean
 - (b) Mode
 - (c) Geometric mean
 - (d) Harmonic mean
67. Ogive curve can be used to determine
- (a) Mean
 - (b) Median
 - (c) Mode
 - (d) Range
68. Along a road there are 5 buildings of apartments, marked as 1, 2, 3, 4, 5. Number of people residing in each building is available. A bus stop is to be setup near one of the buildings so that the total distance walked by the residents to the bus stop from their buildings must be kept minimum. One must consider involving ___ to find the position of the bus stop;
- (a) Mean
 - (b) Median
 - (c) Mode
 - (d) Weighted mean
69. Integrate with respect to x , $1/[x(\log x)^2]$.
- (a) $-1/\log x + k$
 - (b) $1/\log x + k$
 - (c) $\log x$
 - (d) x
70. If MOUSE is coded as 34651 and KEY is coded as 217, then how will YES be coded?
- (a) 715
 - (b) 517
 - (c) 175
 - (d) 571
71. What comes at the last place in R, U, X, A, D, _____?
- (a) E
 - (b) F
 - (c) G
 - (d) H
72. The missing term of the series 4, 13, _____, 49, 76 is
- (a) 26
 - (b) 28
 - (c) 30
 - (d) 32
73. Find the odd one from the following
- (a) Zebra
 - (b) Giraffe
 - (c) Horse
 - (d) Tiger
74. A person walks 1 km (kilometer) towards West and then he turns to South and walks 5km. Again, he turns to West and walks 2 km. After this he turns to North and walks 9 km. How far is he from his starting point?
- (a) 3 km
 - (b) 4 km

- (c) 5 km
(d) 7 km

75. If P_{10} and P_{01} are index for 1 on 0 and 0 on 1 respectively then formula $P_{01} \times P_{10} = 1$ is used for

- (a) Unit Test
(b) Time Reversal Test
(c) Factor Reversal Test
(d) Circular Test

76. The weighted averaged of price relatives of commodities, when the weights are equation to the value of commodities in the current year, yields _____ index number.

- (a) Fisher's ideal
(b) Laspeyres's
(c) Paasche's
(d) Marshall-Edgeworth

77. From the following data base year.

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	4	3	6	2
B	5	4	6	4
C	7	2	9	2
D	2	3	1	5

Fisher's Ideal Index is

- (a) 117.30
(b) 115.43
(c) 118.35
(d) 116.48

78. Index numbers are not helpful in

- (a) Farming economic policies
(b) Recalling trend
(c) Forecasting
(d) Identifying errors

79. The three index numbers, namely, Laspeyre, Paasche and Fisher do not satisfy ____ test.

- (a) Time Reversal
(b) Factor Reversal
(c) Unit
(d) Circular

80. The following date relate to the marks of a group of students:

Marks:	Below 10	Below 20	Below 30	Below 40	Below 50
No. of student	15	38	65	84	100

How many students got marks more than 30?

- (a) 65
(b) 50
(c) 35
(d) 43

81. The following date relate to the marks of 48 students in Statistics:

56	10	54	38	21	43	12	22
48	51	39	26	12	17	36	19
48	36	15	33	30	62	57	17
5	17	45	46	43	55	57	38

43	28	32	35	54	27	17	16
11	43	45	2	16	46	28	45

What are the frequency densities for the class intervals 30-39, 40-49, 50-59?

- (a) 0.20, 0.50, 0.90
 (b) 0.70, 0.90, 1.10
 (c) 0.1875, 0.1667, 0.2083
 (d) 0.90, 1.00, 0.80
- 82.** Given that mean = 70.20 and mode = 70.50, the median is expected to be
 (a) 70.15
 (b) 70.20
 (c) 70.30
 (d) 70.35
- 83.** Multiple axis line chart is considered when
 (a) There is more than one time series
 (b) The units of the variables are different.
 (c) In any case
 (d) If there are more than one time series and units of variables are different.
- 84.** If in a certain code "THANKS" I written a "SKNTHA", then how is "STUPID" written?
 (a) DISPUTS
 (b) DISPUT
 (c) DIPUST
 (d) DIPSTU
- 85.** Daily in the morning the shadow of a Clock Tower installed on Railway Station falls on high rise Mall and in the evening the shadow of the same Mall falls on the Clock Tower installed on Railway Station exactly. So in which direction is Clock Tower of Mall?
 (a) Eastern Side
 (b) Western Side
 (c) Northern Side
 (d) Southern Side
- 86.** R's office is 4 km in East direction from his home and club is 4 km in North direction from his home. On midway from office to club, R starts moving towards his home. In which direction is he facing his back?
 (a) South-East
 (b) North-West
 (c) North-East
 (d) South-West
- 87.** A man starts from a point, walks 4 miles toward North and turns left and walks 6 miles, turns right and walk for 3 miles and again turns right and walk 4 miles and take rest for 30 minutes. He gets up, walks straight 2 miles in the same direction, turns rights, and walks on mile. What is the direction he is facing?
 (a) North
 (b) South
 (c) South-East
 (d) West
- 88.** The hour hand of a clock is in west direction when time is 3' O clock. What is the direction of minutes hand when time is 6:45?
 (a) East
 (b) West
 (c) North
 (d) South

89. A company needs ₹ 10,000 in five years to replace an equipment. How much (in ₹) must be invested none if the rate of interest is @ 8% p.a. in order to provide for this equipment.
- ₹ 6600
 - ₹ 6800
 - ₹ 10000
 - ₹ 11000
90. It needs to pay ₹ 5,00,000 after 10 years. He invested a sum in scheme @ 9% p.a. compounded half-yearly. How much amount (in ₹) be invested.
- 3,07,321
 - 2,70,321
 - 2,07,321
 - 3,40,321
91. An Amount is lent @ 8% simple interest for R years and simple interest was one fourth of the principal amount then R is _____.
- 9 years
 - 6 years
 - $6\frac{3}{4}$ years
 - $3\frac{1}{8}$ years
92. A sum of money is put at 20%. Compound interest rate p.a. At which year the aggregate amount just exceeds the double of the original sum?
- 8
 - 6
 - 4
 - 3
93. The principal value of an amount of ₹25000 to be received after 10 years @ 6% p.a. compounded annually
- 16600
 - 13960
 - 11960
 - 17960
94. For any two events A and B:
- $P(A - B) = P(A) - P(B)$
 - $P(A - B) = P(A) - P(A \cap B)$
 - $P(A - B) = P(B) - P(A \cap B)$
 - $P(B - A) = P(B) + P(A \cap B)$
95. If $P(A) = \frac{2}{3}$, $P(B) = \frac{1}{4}$, $P(A \cap B) = \frac{1}{12}$ then $P\left(\frac{B}{A}\right) =$ _____ :
- $\frac{1}{8}$
 - $\frac{7}{8}$
 - $\frac{8}{7}$
 - None of these
96. In Binomial distribution, if variance = mean² then n & p are:
- 1, $\frac{1}{2}$
 - 1, 1
 - 2, $\frac{1}{2}$

(d) $3, \frac{1}{2}$

97. In _____ distribution, mean = variance:

- (a) Binomial
- (b) Poisson
- (c) Normal
- (d) None of these

98. If $X \sim N(50, 16)$ 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) $P(X > 50) = 0.50$

99. Data collected on religion from the census reports are:

- (a) Primary data
- (b) Secondary data
- (c) Sample data
- (d) (a) or (b)

100. The two lines of regression become identical when:

- (a) $r = 1$
- (b) $r = -1$
- (c) $r = 0$
- (d) (a) or (b)

**“BEST of
LUCK”**

SPACE FOR ROUGH WORK

