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TEST-2

QUESTION BOOKLET CODE: MKG

QUESTION PAPER BOOKLET NO. 2082023

SET-A

ROLL NO.

CA FOUNDATION

(20-08-2023 3:00 P.M. TO 5:00 P.M)

Business Mathematics and Logical Reasoning & Statistics

CHAPTERS

1. Ratio, Proportion, Indices and Logarithmic
2. Equation
3. Time value of money
4. Sequence and series
5. Permutations and combinations
6. Probability and Theoretical Distribution

Time allowed: 2 hours

Maximum Marks : 100

Instructions:

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

01. Find condition that one root is double to the other in equation $ax^2+bx +c=0$

- a) $2b^2= 3ac$
- b) $b^2=3ac$
- c) $2b^2=9ac$
- d) None of these

02. In GP If $T_4 = 3$ the product of first seven term shall be
- 3^5
 - 3^6
 - 3^7
 - None of these
03. If one of the roots of equation $3x^2 - 2kx + 5 = 0$ is 2 the value of k is
- $17/4$
 - $4/17$
 - $-17/4$
 - None of these
04. The sum of first five terms of A P is 75 find the third term
- 15
 - 20
 - 25
 - None of these
05. $\log (1^3 + 2^3 + 3^3 + \dots + n^3)$ is equal to
- $2\log n + 2\log(n+1) - 2\log 2$
 - $\log n + 2\log(n+1) - 2\log 2$
 - $2\log n + \log(n+1) - 2\log 2$
 - None of these
06. In an examination if average marks scored by all the students is 72% and average marks of girls and boys are 64% and 82% the ratio of girls to boys are
- 5 : 4
 - 4 : 5
 - 3 : 4
 - None of these
07. The product of three numbers in GP is 729 and the sum of their square is 819. The number are
- 3,9,27
 - 9,3,27
 - 27,3,9
 - None of these
08. In an Ap if $T_{32} = \frac{1}{45}$ and $T_{45} = \frac{1}{32}$ The T_n will be
- $\frac{n}{1441}$
 - $\frac{n}{1440}$
 - $\frac{n}{1140}$
 - None of these

09. The first and fifth term of an A.P. with 40 terms is -29 and -15 respectively, the sum of all positive terms of A.P. is
- 1605
 - 1705
 - 1805
 - None of these
10. The sum of n terms of an Arithmetic Progression is $2n^2$ the fifth term is
- 20
 - 50
 - 18
 - 25
11. The sum of three numbers in GP is 28 When 7, 2 and 1 are subtracted from the terms respectively the resulting numbers are in A.P. What is the sum of square of numbers?
- 510
 - 456
 - 400
 - 336
12. Find sum up to infinity of $1 + \frac{5}{6} + \frac{9}{36} + \frac{13}{216} + \dots$
- $\frac{44}{25}$
 - $\frac{34}{25}$
 - $\frac{54}{25}$
 - None of these
13. If α and β are the roots of equation $x^2 - bx + c = 0$ find equation whose roots are $(\alpha\beta + \alpha + \beta)$ and $(\alpha\beta - \alpha - \beta)$
- $x^2 - 2cx + (c^2 - b^2) = 0$
 - $x - 2bx + (c^2 + b^2) = 0$
 - $8cx^2 - 2(b + c)x + c^2 = 0$
 - $x^2 + 2bx - (c^2 - b^2) = 0$

14. A person on tour has Rs 9600 for his expenses. If his tour is extended by 16 days he has to cut down daily expenses by Rs 20 his original duration of tour was

- a) 48 days
- b) 64 days
- c) 80 days
- d) None of these

15. Sum upto infinity of series

$$\frac{1}{2} + \frac{1}{3^2} + \frac{1}{2^3} + \frac{1}{3^4} + \frac{1}{2^5} + \dots \dots \dots$$

- a) $\frac{19}{24}$
- b) $\frac{24}{19}$
- c) $\frac{5}{24}$
- d) None of these

16. Find the sum of $2.5 + 3.6 + 4.7 + 5.8 + \dots \dots \dots S_N$

- a) $\frac{1}{6}n(n+1)(2n+1) + \frac{5n}{2}(n+1) + 4n$
- b) $\frac{1}{6}n(n+1)(2n+1) - \frac{5n}{2}(n+1) + 4n$
- c) $\frac{1}{6}n(n+1)(2n+1) + \frac{5n}{2}(n+1) - 4n$
- d) None of these

17. In an AP if 8th term is 15 find the sum first 15 terms

- a) 450
- b) 540
- c) 390
- d) None of these

18. In a normal distribution labour intensive units with 30,000 workers 5% draw more than 50,000 and 5% of workers draw less than 15,000 find C/V ($Z=1.65 @ 45\%$)

- (a) 28.98%
- (b) 24.67%
- (c) 32.63%
- (d) None of these

19. In a Poisson distribution $3P(x=4) = 6P(x=5)$ find 4th moment

- (a) 18.75
- (b) 16.90
- (c) 17.60
- (d) None of these

20. In a symmetrical Binomial Distribution with 324 trials, the 4th moment is

- (a) 14578
- (b) 18676
- (c) 19683
- (d) None of these

21. If α and β are the roots of equation $3x^2+9x - 12 = 0$ the value of $\alpha^2 - \beta^2$

- (a) 15
- (b) -15
- (c) ± 15
- (d) None of these

22. If the word G O U R M E T is written in different ways find Probability no two vowels are together

- (a) $\frac{2}{7}$
- (b) $\frac{5}{7}$
- (c) $\frac{3}{7}$
- (d) None of these

23. If the word "F A S T I D I O U S" is written in different ways find probability vowels and consonants are written alternatively.

- (a) $\frac{1}{126}$
- (b) $\frac{1}{252}$
- (c) $\frac{1}{504}$
- (d) None of these

24. If the word COMMERCE is written in different ways find probability 4 letters are written in between both the Ms

- (a) $\frac{3}{28}$
- (b) $\frac{5}{28}$
- (c) $\frac{6}{28}$
- (d) None of these

25. Beg I $\left[\begin{array}{cc} \text{Red} & \text{Blue} \\ 4 & 6 \end{array} \right]$

Beg II $[3 \quad 7]$

Beg III $[5 \quad 5]$

A ball is selected and found Blue find Probability it is selected from beg II

- (a) $\frac{7}{18}$
- (b) $\frac{5}{18}$
- (c) $\frac{11}{18}$
- (d) None of these

26. If The word AMBIGUITY Is written in different ways find probability vowels occupy only even places
- 1/126
 - 2/126
 - 7/126
 - None of these
27. A Company had declared dividend @ Rs 300 three years back with 10% growth if cost of equity is 21% the Market Price of share is
- Rs 3,260
 - Rs 3,630
 - Rs 4,170
 - None of these
28. $\frac{20^n+5^n}{20^{n-1}+5^{n-1}}=10$ find $(n + 3)$
- 1/2
 - 1/2
 - 5/2
 - None of these
29. In two Arithmetic progressions if ratio of nth term is $(2n + 7) : (5n - 9)$ the ration of sum of 200 terms is
- 987:208
 - 416:987
 - 52:242
 - None of these
30. Find value $(729), (729)^{\frac{1}{7}}, (729)^{\frac{1}{49}}, (729)^{\frac{1}{729}} \dots \dots \dots S_{\infty}$
- 2187
 - 729
 - 6561
 - None of these
31. If a project costing Rs 200 lacs will generate profit of Rs 23,00,000 for next 10 years and after that it will be sold for Rs 72.00 lakh find financial viability of project if cost of opportunity is 10% pa
- NPV is equal to project cost
 - Financial viable
 - not viable financially
 - none of these
32. A 4 digit number is formed with 1, 3, 4, 5, 7, 9 find probability number formed lies between 4300 and 7500
- $\frac{2}{5}$
 - $\frac{3}{5}$
 - $\frac{1}{5}$
 - None of these

33. An amount becomes triple in 10 years if compounded quarterly. Find rate of interest
- (a) 6.98%
 - (b) 7.56%
 - (c) 8.32 %
 - (d) None of these
34. In a manufacturing unit if 2.50% items produced are defective, the probability out of 300 items only 2 are defective is
- (a) 15.01%
 - (b) 5.06%
 - (c) 1.56%
 - (d) None of these
35. In a normally distributed factory with 20,000 employees if 15% employees draw less than ₹ 20,000 and SD is computed as 6000 find average salary ($z = 1.04$ at 35% Probability)
- (a) 13,760
 - (b) 26,240
 - (c) 20,000
 - (d) None of these
36. If 4th central moment in poison distribution is computed as 243 the C/V is computed as
- (a) 33.33 %
 - (b) 52.17%
 - (c) 46.80%
 - (d) None of these
37. A plant was depreciated @15% for first 4 years @ 20% for next 3 years and @25% for another 3 years. If written down value of the plant after 10 year is ₹ 3,74,000 the cost of plant is
- (a) Rs 33,16,820
 - (b) Rs 31,90,870
 - (c) Rs 11,57,900
 - (d) None of these
38. X and Y are independent normal variable with mean 100 and 80 and SD are 4 & 3 respectively find probability distribution of (X and Y)
- (a) 180 and 25
 - (b) 180 and 5
 - (c) 180 and 7
 - (d) None of these
39. In the normally distributed factory with 30,000 employees if mean is computed as 40,000 and RD is computed as 27,000 how many workers draw salary Less than 13,000
- (a) 342
 - (b) 1368
 - (c) 684
 - (d) None of these

40. If the word PLAGIARISM is written in different ways, probability the place of vowel and place of consonants will remain the same
- $\frac{1}{210}$
 - $\frac{2}{105}$
 - $\frac{3}{70}$
 - None of these
41. If a , b , c are the T_p , T_q and T_r Terms of the GP, the value $a^{q-r} b^{r-p} c^{p-q}$ is
- 0
 - 1
 - 2
 - None of these
42. A theoretical probability distribution.
- does not exist
 - Exists only in theory
 - exists in real life
 - both (b) and (c)
43. For a normal distribution with mean as 500 and SD as 120, what is the value of k so that the interval $[500, k]$ covers 40.32 % area of the normal curve? Given $z = 1.30$ at $p = .4032$
- 740
 - 750
 - 656
 - None of these
44. Reaction in some medicine follow
- Normal Distribution
 - Poisson's Distribution
 - Binomial Distribution
 - None of these
45. If 6 boys and 5 girls are made to sit in a circle find Probability all the girls are not together
- $\frac{41}{42}$
 - $\frac{6}{11}$
 - $\frac{1}{42}$
 - none of these
46. A and B stand in a queue with 6 more persons find probability exactly 3 persons are between A and B in the queue
- $\frac{1}{11}$
 - $\frac{1}{9}$
 - $\frac{1}{7}$
 - none of these

47. If the word ANNUITY is written in different ways find probability all the vowels and all the consonants are not together
- (a) $\frac{2}{35}$
 - (b) $\frac{33}{35}$
 - (c) $\frac{5}{42}$
 - (d) none of these
48. If $P(A) = p$ and $P(B) = q$ the
- (a) $P(A/B) > p/q$
 - (b) $P(A/B) < p/q$
 - (c) $P(A/B) = p/q$
 - (d) (b) and (c) both
49. An experiment succeeds twice as often as it fails. What is the probability out of 5 trials in majority of the cases it will succeed.
- (a) $\frac{33}{81}$
 - (b) $\frac{46}{81}$
 - (c) $\frac{64}{81}$
 - (d) $\frac{25}{81}$
50. In an AP if ratio of t_7 and t_{10} is 5:7 what should be the ratio in t_8 and t_{11}
- (a) 13:16
 - (b) 17:23
 - (c) 14:17
 - (d) none of these
51. A loan of Rs 5,00,000 was repaid in 50,000 annually @ 5% find the number of instalments
- (a) 13 years
 - (b) 12 years
 - (c) 14 years
 - (d) none of these
52. If the word GOOGLE is written in dictionary find the rank of the word dictionary
- (a) 88
 - (b) 194
 - (c) 172
 - (d) none of these
53. How many straight lines can be formed with 10 points if 5 are collinear
- (a) 35
 - (b) 37
 - (c) 36
 - (d) none of these

54. In how many ways 4 letters can be selected out of the word COMMERCIAL
- (a) 210
 - (b) 113
 - (c) 197
 - (d) none of these
55. If α and β are the roots of equation $x^2-5x+6=0$ then the equation whose roots are $(\alpha^2+\beta)$ and $(\alpha+\beta^2)$
- (a) $x^2-9x+99=0$
 - (b) $x^2-18x+90=0$
 - (c) $x^2-18x+77=0$
 - (d) none of these
56. In -----Distribution the direction of curve changes with the change in value of p
- (a) Binomial
 - (b) Poisson
 - (c) Normal distribution
 - (d) none of these
57. If in a symmetrical binomial distribution. The C/V is computed as 5%. Find the number of trials.
- (a) 100
 - (b) 200
 - (c) 400
 - (d) None of these
58. A 4 digit number is formed with 1, 3, 4, 5, 7, 9 find probability number formed lies between 4300 and 7500
- (a) $\frac{2}{5}$
 - (b) $\frac{3}{5}$
 - (c) $\frac{1}{5}$
 - (d) None of these
59. In a manufacturing unit if 2.50% items produced are defective, the probability out of 300 items only 2 are defective is
- (a) 15.01%
 - (b) 5.06%
 - (c) 1.56%
 - (d) None of these
60. In which of the following Distribution Mean is square of Standard Deviation
- (a) Binomial Distribution
 - (b) Poissons Distribution
 - (c) Normal Distribution
 - (d) None of these

61. A sum of Rs 4,90,000 is divided into 3 parts such that the corresponding interest earned after 2 3 and 5 years is equal if the rates of simple interest is 7% 8% and 10% respectively., the largest part is
- 2,62,970
 - 1,53,399
 - 73,634
 - none oof these
62. An asset is purchased on EMI of Rs 20,000 for next 9 years @ 6% p.a. starting from today and after that Rs 10,000 quarterly on perpetual basis, the cost of asset is
- 23,36,534
 - 16,65,868
 - 25,66,667
 - None of these
63. If 5 coins are tossed 1600 times in how many ways there will be at least 4 heads
- 300
 - 350
 - 250
 - None of these
64. If a random variable x follows Normal Distribution with Mean as 60 and standard deviation as 20 what is the probability ($x < 80/x > 60$)
- .6826
 - .5045
 - .5167
 - None of these
65. In a state the per capita income is computed as 43,000 with Range Deviation 26,000 but 10% people are living below poverty line, the income at poverty line is fixed at ($z = 1.29$ at 0.40)
- 25900
 - 33750
 - 26230
 - none of these
66. If sum of Mean and variance of 5 trials is 1.80 the distribution is
- symmetrical
 - positively skewed
 - negatively skewed
 - None of these
67. 6 married couples are gathered in a room, two persons are selected find probability one gentleman and one lady who is not the spouse of selected gentleman
- 15/33
 - 12/33
 - 25/66
 - None of these
68. A certain sum amounts to Rs 15,748 in 3 years at simple interest @ $r\%$ p. a the same sum amounts to Rs 16,510 at 2 % higher ($r + 2$)% p.a. on simple interest the rate of interest is
- 10%
 - 8%
 - 12%
 - 6%

69. A biased coin is tossed such that probability of getting head is thrice the probability of getting tail . Find probability of all heads if coin is tossed 4 times
- (a) $81/128$
 - (b) $81/256$
 - (c) $18/81$
 - (d) $2/5$
70. For a normal distribution having mean = 2 and variance = 4, the fourth central moment is
- (a) 16
 - (b) 32
 - (c) 48
 - (d) 64
71. The ratio of principal and the compound interest value for three years (compounded annually) is 216:127 The rate of interest is:
- (a) 0.1567
 - (b) 0.1777
 - (c) 0.1667
 - (d) 0.1588
72. The salvage value of plant is Rs 23,00,000 which was purchased for Rs 54,00,000 and was depreciated @ 15% what is the age of plant
- (a) 5 years 7 months
 - (b) 5 years 3 months
 - (c) 5 years 9 months
 - (d) none of these
73. An experiment succeeds 10 times as often as it fails. What is the probability out of 10 trials in majority of the cases it will succeed.
- (a) $\frac{33}{81}$
 - (b) $\frac{46}{81}$
 - (c) $\frac{64}{81}$
 - (d) None of these
74. Sum of n terms of two APs are in the ratio of $(7n - 5) : (5n + 17)$. Then which of the term of APs are equal to each other
- (a) 12
 - (b) 6
 - (c) 3
 - (d) None of these
75. An amount becomes double in 6 years if compounded semi-annually. How long it will take in becoming the amount triple if compounded monthly.
- (a) 8 years 5 months
 - (b) 9 years 3 months
 - (c) 9 years 5 months
 - (d) None of these

76. The effective rate of interest is @ 19.75% p.a. if compounded fortnightly, the nominal rate of interest will be
(a) 18%
(b) 24%
(c) 27%
(d) None of these
77. In a Probability Distribution with maximum variance the non probability is calculated as
(a) $\frac{1}{2}$
(b) $\frac{2}{3}$
(c) $\frac{1}{3}$
(d) None of these
78. If $x = 6^{1/3} + 6^{-1/3}$ the value of $18x^3 - 54x$ is
(a) 111
(b) 37
(c) 108
(d) none of these
79. 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
80. The number of four letter words can be formed using the letters of the word DECTIONARY is
(a) 5040
(b) 720
(c) 90
(d) 30240
81. If the sum and product of three numbers in G.P. are 7 and 8 respectively, then 4th term of the series is
(a) 6
(b) 4
(c) 8
(d) 16
82. 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 $P(10,0.10) = 15.9374208$)
(a) ₹ 3,13,726.87
(b) ₹ 4,13,726.87
(c) ₹ 3,53,726.87
(d) ₹ 4,53,726.87
83. 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?
(a) 23:36
(b) 28:41
(c) 31:43
(d) 35:46

84. If $\log_{10}^3 = x$ and $\log_{10}^4 = y$, then the value of \log_{10}^{120} can be expressed as
- (a) $x-y+1$
 - (b) $x+y+1$
 - (c) $x+y-1$
 - (d) $2x+y-1$
85. 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,
86. 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
87. If the square of a number exceeds twice of the number by 15, then number that satisfies the condition is
- (a) -5
 - (b) 3
 - (c) 5
 - (d) 15
88. The value of $\left(1 - \sqrt[3]{0.027} \left(\frac{5}{6}\right) \left(\frac{1}{2}\right)^2\right)$ is:
- (a) $11/16$
 - (b) $13/16$
 - (c) $15/16$
 - (d) 1
89. Which of the equation roots are -3, 1, 2
- (a) $x^3-6x^2+11x-6=0$
 - (b) $x^3-7x+6=0$
 - (c) $x^3-3x^2+2x=0$
 - (d) None of these
90. A man invested $\frac{1}{3}$ of his capital at 7%, $\frac{1}{4}$ at 8% and the remainder at 10% simple interest. If his annual income is Rs. 561, the capital is:
- (a) Rs. 5400
 - (b) Rs. 6000
 - (c) Rs. 6600
 - (d) Rs. 7200
91. If a sum triple itself in 6 years at C.I. In how many years it will be 27 times itself at the same rate?
- (a) 18
 - (b) 54
 - (c) 12
 - (d) 27

92. Rs. 2,600 were given on interest in two parts. If simple interest of first part in 3 years with 5% interest rate is equal to simple interest of second part in 6 years with 4% interest rate. What is the second part?
- Rs. 1,600
 - Rs. 1,300
 - Rs. 900
 - Rs. 1,000
93. In how many ways 6 men can sit at a round table so that all shall not have the same neighbour in any two occasions?
- 5!
 - $5! \div 2$
 - $(7!)^2$
 - 7!
94. If ${}^n P_r = 2880$ and ${}^n C_r = 120$ then the value of r is :-
- 24
 - 6
 - 4
 - 3
95. The odds in favour of an event is 2 : 3 and odds against another event is 3 : 7. Find the probability that only one of the two events occurs.
- $\frac{27}{50}$
 - $\frac{17}{50}$
 - $\frac{37}{50}$
 - $\frac{47}{50}$
96. Net Present Value (NPV)
- Present value of net cash Inflow – Total net Investment
 - Present value of net cash Inflow – Present value of cash outflow
 - Total net Investment- Present value of net cash Inflow
 - a or b
97. Y bought Motor Bike Costing 80,000 by making down payment of Rs. 30000 and agreeing to make annual payment for four years. How much would be each payment if the interest on unpaid amount be 14% compounded annually. [Given $P(4, 0.14) = 2.91371$]
- ₹ 17160.25
 - ₹ 17600.25
 - ₹ 15600.25
 - ₹ 16600.25
98. Which of the following results hold for a set of distinct positive observations?
- $AM \geq GM \geq HM$
 - $HM \geq GM \geq AM$
 - $AM > GM > HM$
 - $GM > AM > HM$

99. Given that $P(A) = 1/2$, $P(B) = 1/3$, $P(A \cap B) = 1/4$, what is $P(A' \cap B')$

- (a) $1/2$
- (b) $7/8$
- (c) $5/8$
- (d) $2/3$

100. A binomial distribution is

- (a) never symmetrical.
- (b) never positively skewed.
- (c) never negatively skewed.
- (d) symmetrical when $p = 0.5$.

SPACE FOR ROUGH WORK