TEST-2

QUESTION BOOKLET CODE: MKG
QUESTION PAPER BOOKLET NO. 2142022

ROLL NO. 654821

CA FOUNDATION

(14-08-2022 3:00 P.M. TO 5:00 P.M)

Business Mathematics and Logical Reasoning & Statistics

CHAPTERS

1. **Permutation and Combination**
2. **Time value of Money**
3. **Sequence and Series**

4. **Equation**
5. **Ratio, proportion, Indices and Logarithmic**

Time allowed: 2 hours   Maximum Marks : 100

Instructions:

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

01. $\log_{2\sqrt{2}}512 : \log_{3\sqrt{2}}324$ is equal to

   a) 128:81

   b) 4:3

   c) 3:2

   d) none of these

02. 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

03. If y=1+x+x²+x³+-------------up to infinity the value of x is

   a) $\frac{1}{1-x}$

   b) $\frac{1}{1+x}$

   c) $\frac{4}{4-x}$

   d) None of these

04. In GP If T₄= 3 the product of first seven term shall be

   a) 3^5

   b) 3^6

   c) 3^7

   d) None of these

05. In a simple interest if the principal is Rs 2000 and rate and time are roots of the equation

x²-11x+30=0. The simple interest will be

   a) 500

   b) 600

   c) 700

   d) None of these

06. What is the present value of perpetuity of Rs 50,000 pm @12% p.a

   a) Rs 45,00,000

   b) Rs 60,00,000

   c) Rs 50,00,000

   d) None of these

07. The number of parallelograms that can be formed by a set of 6 horizontal and 4 vertical lines,

   a) 60

   b) 90

   c) 120

   d) None of these

08. If one of the roots of equation $3x^2-2kx + 5 = 0$ is 2 the value of k is

   a) 17/4

   b) 4/17

   c) -17/4

d) None of these

09. If $\log_{0.1}(10{,}000) = x$ the value of x is

   a) 1

   b) -2

   c) -4

   d) None of these

10. The sum of first five terms of A P is 75 find the third term

   a) 15

   b) 20

   c) 25

   d) None of these

11. If a : b=2:3 ,b : c=4:5 C:D=6:7   find ratio of A : B : C : D

   a) 16 : 24 : 30 : 35

   b) 24 : 30 : 16 : 35

   c) 16 : 24 : 35 : 30

   d) None of these

12. Log ($1^3 + 2^3 + 3^3 +$----------------------n^3) is equal to

   a) 2logn +2log(n+1)-2log2

   b) logn +2log(n+1)-2log2

   c) 2logn+log(n+1)-2log2

   d) None of these

13. If difference in roots of the equation x^2-kx+8=0 is 4 the value of k is

   a)   ±4

   b)   ±8$\sqrt{3}$

   c)   ±4$\sqrt{3}$

   d)   None of these

14. 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) $\frac{2}{x^2} + \frac{1}{y^2} = \frac{1}{z^2}$

   c) $\frac{1}{x^2} + \frac{2}{y^2} = \frac{1}{z^2}$

   d) None of these

15. Find the value of

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

a) 2

b) 5

c) 3

d) None of these

16. If $x = \dfrac{1}{5+2\sqrt{6}}$ then the value of $x^2 - 10x + 1$ is

a) 0

b) $\sqrt{15} + \sqrt{3}$

c) 10

d) None of these

17. If A B C D E and F are made to sit in a circle, in how many ways it is possible if A always have either B or C on his right and B always have either C or D on his right

a) 3

b) 6

c) 18

d) None of these

18. In how many ways MONDAY can be written starting with M but not ending with N

a) 720

b) 120

c) 96

d) None of these

19. A polygon has 44 diagonals the number of sides are

a) 8

b) 9

c) 10

d) None of these

20. Find the value of x if $^{10}c_3 + 2\ ^{10}c_4 + ^{10}c_5 = {}^x c_5$

a) 10

b) 12

c) 14

d) None of these

21. If α and β are the roots of equation $3x^2 + 9x - 12 = 0$ the value of α2 - β2

  a) 15

  b) -15

  c) ±15

  d) None of these

22. Find fort-nightly saving If Rs 5,80,000 is required after a period of 24 months @ 6% pa

  a) 11888

  b) 12904

  c) 11388

  d) None of these

23. Find issue price of 10% bond of Rs 2000 redeemable after 7 years at 5% premium if opportunity cost is 15% p.a.

  a) 1709

  b) 1621

  c) 1591

  d) None of these

24. 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

  a) 5 : 4

  b) 4 : 5

  c) 3 : 4

  d) None of these

25. If the word STRAIGHT is written in different ways in how many ways the word starts with G and ends with T.

  a) 720

  b) 1440

  c) 360

  d) None of these

26. How many code words are possible with two alphabets followed by three digits between (1 to 9)

  a) 327600

  b) 331700

  c) 326700

d) None of these

27. 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

28. If market price of a share is Rs 1100 and growth is 7% company had declared a dividend of Rs 35 during last year, the cost of equity capital is

   a) 10.18%

   b) 10.40%

   c) 3.09%

   d) None of these

29. If $(\log_{\sqrt{x}}2)^2 = \log_x 2$ the value of x will be

   a) 16

   b) 32

   c) 8

   d) None of these

30. How many different factors can be made with 1,05,600.

   a) 127

   b) 113

   c) 119

   d) None of these

31. A plant costing Rs 40,00,000 was depreciated @ 12% if written down value of plant is Rs 18,60,000 the plant is ---------years old

   a) 5

   b) 6

   c) 7

   d) None of these

32. In how many ways at least 2 friends out of 10 can be invited

   a) 1013

   b) 975

   c) 1024

d) None of these

33. If $2^a = 4^b = 8^c$ and abc = 288 then the value of $\dfrac{1}{2a} + \dfrac{1}{4b} + \dfrac{1}{8c}$ is

   a) 1/8

   b) 1/16

   c)11/96

   d) None of these

34. If the value of a=3+2$\sqrt{2}$ find the value of $a^{\frac{1}{2}} - a^{-\frac{1}{2}}$

   a) 2$\sqrt{2}$

   b) 2

   c) $-2\sqrt{2}$

   d) None of these

35. The product of three numbers in GP is 729 and the sum of their square is 819. The number are

   a) 3,9,27

   b) 9,3,27

   c) 27,3,9

   d) None of these

36. The amount on maturity if an amount if Rs 10,000 annually is invested starting from today @ 8% p.a for

   next 10 years

   a) Rs 1,56,454

   b) Rs 1,44,865

   c) Rs 1,56,554

   d) None of these

37. M/s A (mfg.) Ltd. wishes to replace a plant costing Rs 40,00,000 after 6 years when prices will increase by

   30%. How much company should invest annually to replace the plant if opportunity cost is 10% pa

   a) Rs 6,73,959

   b) Rs 6,90,898

   c) Rs 7,28,976

   d) None of these

38. In an Ap if $T_{32} = \dfrac{1}{45}$ and $T_{45} = \dfrac{1}{32}$ The T_n will be

   a) $\dfrac{n}{1441}$

   b) $\dfrac{n}{1440}$

c) $\dfrac{n}{1140}$

d) None of these

39. The difference in simple interest and compound interest to be compounded quarterly @ 10% for 4 years is Rs 22,000 find the investment

a) Rs 2,76,560

b) Rs 2,54,350

c) Rs 2,60,355

d) None of these

40. 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

a) 1605

b) 1705

c) 1805

d) None of these

41. If $\log_2 X + \log_4 X + \log_{32} X = \dfrac{17}{10}$ value of x

a) 8

b) 5

c) 2

d) None of these

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

a) xyz

b) $\dfrac{-1}{yz}$

c) $\dfrac{1}{xyz}$

d) $\dfrac{1}{x+y+z}$

43. $\log_4 x + \log_{16} x + \log_{64} x + \log_{256} x = \dfrac{25}{12}$ The value of X is

a) 64

b) 4

c) 16

d) 2

44. The sum of n terms of an Arithmetic Progression is $2n^2$ the fifth term is

a) 20

b) 50

c) 18

d) 25

45. 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?

a) 510

b) 456

c) 400

d) 336

46. The number of ways 5 boys and 5 girls can be made to sit in a round table if no two boys are together

a) 2550

b) 2880

c) 625

d) 2476

47. A sum of money becomes Rs 27,900 in 3 years and Rs 41,850 in 6 years at a certain rate of interest on annual compounding the value of investment is

a) 16080

b) 18,600

c) 18060

d) 16800

48. If the nominal rate of growth is 17% and inflation rate is 9% the G D P after 6 years will be

a) 1.587 times

b) 1.921 times

c) 1.403 times

d) 2.510 times

49. The price of share increased to Rs 157.36 from Rs 90 in five years the CAGR is

a) 11.77%

b) 9.68%

c) 8.87 %

d) None of these

50. The effective rate of interest if nominal rate is 24% compounded monthly

a) 24%

b) 26.82%

(c) 25.28%

d) 24.24%

51. 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

a) 10%

b) 8%

c) 12%

d) 6%

52. If a $= \frac{4\sqrt{18}}{\sqrt{6}+\sqrt{3}}$ the value of $\frac{a+2\sqrt{6}}{a-2\sqrt{6}} + \frac{a+2\sqrt{3}}{a-2\sqrt{3}}$

a) 2

b) 3

c)   4

d) 5

53. Find sum up to infinity of $1 + \frac{5}{6} + \frac{9}{36} + \frac{13}{216} +$-------------------------

a) $\frac{44}{25}$

b) $\frac{34}{25}$

c) $\frac{54}{25}$

d) None of these

54. A traders mixes two qualities of rice Costing Rs 90/kg and Rs 60/Kg to sell the product at 70 /kg and earns Rs 5/kg. What ratio it should be mixed

a) 1:5

b) 5:1

c) 3:2

d) None of these

55. In an examination average marks score by students is 78% if girls scored 83% and boys scored 71% the percentage of girls in an examination is

a) 43.62%

b) 41.67%

c) 58.33%

d) None of these

56. log 144 is equal to

a) 2 log 4 + 2log2

b) 4log 2 + 2log3

c) 3log2+ 4log3

d) None of these

57. If $(a)^{1/3}+(b)^{1/3}+(c)^{1/3}=0$ then value of $\left(\dfrac{a+b+c}{3}\right)^3$ is equal to

a) abc

b) 9abc

c) 1/abc

d) None f these

58. $15(2p^2-q^2) =7pq$ while p and q are positive find ratio of p:q

a) 5:6

b) 5:7

c) 3:5

d) 8:3

59. If α and β are the roots of equation $x^2+x+r=0$ $\alpha^3+\beta^3=-6$ the value of r is

a) -5/3

b) 7/3

c) -4/3

d) None of these

60. If α and β are the roots of equation $x^2-bx+c=0$ find equation whose roots are $(\alpha\beta+\alpha+\beta)$ and $(\alpha\beta-\alpha-\beta)$

a) $x^2-2cx+(c^2-b^2)=0$

b) $x-2bx+(c^2+b^2)=0$

c) $8cx^2-2(b+c)x+c^2=0$

d) $x^2+2bx-(c^2-b^2)=0$

61. 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

62. Find EMI if Rs 43 lacs is required to be repaid in 6 years @ 9% p.a.

a) Rs 77510

b) Rs 73450

c) Rs 85045

d) None of these

63. Find amount receivable after 11 years if Rs 40,000 quarterly is invested @ 11% pa

a) 35 78 905

b) Rs 3344201

c) 1760000

d) None of these

64. A plant was purchased 7 years ago for a cost of Rs 65 lacs find the rate of depreciation if present written down value is 30.90 lacs

a) 12.09%

b) 11.08%

c) 10.08%

d) None of these

65. Find Amount after 6 years 3 months if Rs 45 lacs is invested @ 10%pa to be compounded quarterly

a) Rs 83 42 748

b) Rs 8243780

c) Rs 76 89 760

d) None of these

66. A company wishes to replace a plant costing Rs45 lacs after 9 years when prices will be increased by 20% Find annual provision for replacing the plant if opportunity cost is 11% p.a.

a) 341600

b) Rs 381250

c) Rs 356670

d) None of these

67. 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 salary, then what will be the ratio of their salaries?

a) 3 : 3 : 10

b) 10 : 11 : 20

c) 23 : 33 : 60

d) Cannot be determined

68. How many odd numbers of four digit can be formed with digit 0, 1, 2, 3, 4, 7 and 8

a) 150

b) 300

c) 120

d) 210

69. $^{n}C_p + 2^{n}C_{p-1} + {}^{n}C_{p-2}$

a) $^{n}C_p$

b) $^{n+2}C_p$

c) $^{n+1}C_{p+1}$

d) $^{n+2}C_{p+1}$

70. Sum upto infinity of series

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

a) $\frac{19}{24}$

b) $\frac{24}{19}$

c) $\frac{5}{24}$

d) None of these

71. The ratio of two numbers are 3:4. The difference of their square is 28 Greater no. is:

a) 8

b) 12

c) 24

d) 64

72. 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

73. If a $= \sqrt{\frac{7+4\sqrt{3}}{7-4\sqrt{3}}}$ then find the value of $[a(a-14)]^2$

a) 1

b) 2

c) -1

d) None of these

74. Find the sum of $2.5 + 3.6 + 4.7 + 5.8 + \text{----------------------------------}S_N$

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

75. If x $= \sqrt{42 + \sqrt{42 + \sqrt{42 + 42} \ldots \ldots \ldots \ldots \ldots \ldots \infty}}$ the value of x is

a) 7

b) 6

c) 10

d) None of these

76. If $x = 5^{\frac{1}{3}} + \dfrac{1}{5^{\frac{1}{3}}}$ the value of $5x^3 - 15x$ is

   a) 26

   b) 20

   c) 27

   d) None of these

77. If $3^x = 5^y = 1875^z$ find $z = ?$

   a) $\dfrac{xy}{4x+y}$

   b) $\dfrac{xy}{x+4y}$

   c) $\dfrac{4xy}{x+y}$

   d) None of these

78. If $(4.80)^x = (.48)^y = 10000$ then

   a) $\dfrac{1}{x} - \dfrac{1}{y} - \dfrac{1}{4} = 0$

   b) $\dfrac{1}{x} + \dfrac{1}{y} + \dfrac{1}{4} = 0$

   c) $\dfrac{1}{x} + \dfrac{1}{y} - \dfrac{1}{4} = 0$

   d) None of these

79. In a hall there are 10 chairs Numbered $1 - 10$. 3 ladies and 4 gents are made to sit, if ladies opt first out of the chairs Numbered 1 to 5 and gents opt out of the remaining find in how many ways they can be made to sit

   a) 2,100

   b) 50,400

   c) 8,400

   d) None of these

80. 10 persons are made to sit in a circle find in how many ways. neighbours are never together

   a) 181440

   b) 362880

   c) 184440

   d) None of these

81. Out of 6 gents and 4 ladies a committee is to be formed consisting of at least 2 ladies and atleast double the gents in how many ways it can be formed

a) 136

b) 62

c) 60

d) None of these

82. Find the sum of all 5 digit numbers formed with 2, 3, 5, 7 and 9

a) 69,33,264

b) 67,29,462

c) 69,19,624

d) None of these

83. An amount becomes 4 times at simple interest in just 30 years find how much time it takes in becoming 7 times

a) 60 years

b) 45 years

c) 72 years

d) None of these

84. Find issue price of 11% Bond of ₹ 800 redeemable after 8 years at a premium of 12% if opportunity cost is @ 14%

a) 732.90

b) 689.80

c) 722.30

d) None of these

85. in and AP if 8th term is 15 find the sum first 15 terms

a) 450

b) 540

c) 390

d) None of these

86. The company had declared dividend @ 50 per shares 4 years back with a growth of 8% if cost of equity is 20% find Market price of share is

a) Rs 705

b) Rs 567

c) Rs 604.

d) None of these

87. Find PV of an annuity of ₹ 10,000 pm for 61 months receivable on advance basis @ 9% pa

a) 471733

b) 481733

c) 491733

d) None of these

88. An amount of Rs 45 lacs repayable after 9 years @ 11% compounded quarterly is preponed to 5 years the amount repayable shall be
    a) 2346651
    b) 3152096
    c) 2746216
    d) None of these

89. An amount of Rs 50 lacs is lent to 3 persons A B and C for 6 years 7 years and 9 years respectively @ 10% p.a. Compounded annually if all repay the equal amount find the amount lent to B.
    a) 1708730
    b) 1981132
    c) 1789655
    d) None of these

90. Repayment of loan is
    a) Loan × discounting factor
    b) Loan × compounding factor
    c) loan ÷ discounting factor
    d) None of these

91. Future Value of annuity is
    a) Periodical investment × compounding factor
    b) Periodical investment × discounting factor
    c) Periodical Investment ÷ compounding factor
    d) None of these

92. A house was purchased by paying Rs 4,00,000 as down payment and 84 EMIs of Rs 23,000 each if opportunity cost is 9%pa what is the cost price of house.
    a) 14,29,540
    b) 18,29,540
    c) 10,29,540
    d) None of these

93. The plant costing Rs 76,00,000 was purchased 9 years back and was depreciated on diminishing balance method If the wdv of plant is Rs 34,89,000 the average rate of depreciation is
    a) 8.10%
    b) 9,67%
    c) 8.29%
    d) None of these

94. 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

95. The difference in simple interest and compound interest Compounded qrtly for 5 years @ 11% pa is Rs 4,89,000 the amount of investment is
    a) 2869276

b) 362095

c) 2897565

d) None of these

96. How many code words are possible with three distinct alphabets followed by 4 digits between 1 to 9

   a) 47174400

   b) 36789670

   c) 36,28,800

   d) None of these

97. If $\dfrac{9^y 3^2 (3^{-y})^{-1} - 27^y}{3^{3x}.2^3} = \dfrac{1}{27}$ then the value $(x - y)$ is

   a) -1

   b) 0

   c) 1

   d) None of these

98. Show that $\left(x^{\frac{b+c}{c-a}}\right)^{\frac{1}{a-b}} \times \left(x^{\frac{c+a}{a-b}}\right)^{\frac{1}{b-c}} \times \left(x^{\frac{a+b}{b-c}}\right)^{\frac{1}{c-a}}$ reduces to

   a) 1

   b) 3

   c) -1

   d) None of these

99. The value of $4 \log \dfrac{8}{25} - 3 \log \dfrac{16}{125} - \log 5$ is

   a) 0

   b) 1

   c) 2

   d) None of the these

100. a^2, b^2, c^2 are in AP then $\dfrac{a}{(b+c)} + \dfrac{b}{(c+a)} + \dfrac{c}{(a+b)}$ is equal to

   a) $\dfrac{24}{45}$

   b) $\dfrac{45}{24}$

   c) $\dfrac{1}{12}$

   d) None of these

SPACE FOR ROUGH WORK