CA FOUNDATION | JUNE 2023 ATTEMPT | BUSINESS MATHEMATICS, STATISTICS & LOGICAL REASONING | MEMORY BASED QUESTION PAPER

1) Evaluate the integral $\int \frac{1}{(x-1)(x-2)} dx$

a) $\log\left(\frac{x-2}{x-1}\right) + c$

b) $\log\left([(x-2)(x-1)]\right) + c$

c) $\log\left(\frac{x-1}{x-2}\right) + c$

d) $\log\left([(x-2)(x+1)]\right) + c$

2) Given the relation R = {(1, 2), (2, 3)} on the set A = {1, 2, 3} then the minimum number of ordered pairs which when added to R make it is equivalence relation.

a) 5 b) 7 c) 6 d) 8

3) For a given **Curve** $y = 2 - x^2$ when x increase at the rate of 3 units/s then the slope of the curve will be

a) Increase at 6 units/s

b) Increase at 3 units/s

c) Decrease at 6 units/s

d) Decrease at 3 units/s

4) If the 9th and 19th terms of A.P are 35 and 75 respectively then its 20th term is.

a) 78 b) 79 c) 80 d) 81

5) The share holding pattern of ABC Ltd. Is as follows.

Share holders	Promoter	F II	D II	Others	Public
No. of shares in million	120	25	20	20	15

What is the difference between central angles in degrees for share holders promoter and public in pie – chart?

a) 216 b) 189 c) 180 d) 99

6) 4x + 3y + 11 = 0, then mean deviation of y = 7.20. find the mean deviation of x?

a) 2.70 b) 7.20 c) 4.50 d) 5.40

7) A professor has assigned a work to students in a statistics class. A student jagan computer the AM & SD for a net of 100 observations as 50 & 5 respectively. Later on sonali points out to jagan that he has made mistake in taking one observations as 100 instead of 50. What would be the correct $\bar{x}$ if the wrong observations in corrected.

a) 50.5 b) 49.9 c) 49.5 d) 50.1

8) Calculate $\bar{x}$ for the following:

CA	10-20	20-30	30-40	40-50	50-60	60-70	70-80
f	9	13	6	4	6	2	3

a) 23.7 b) 35.7 c) 39.7 d) 45.7

9) Consider the data

Year	Base year		Current year	
Commo-dities	Price	Quantity	Price	Quantity
A	10	5	20	2
B	15	4	25	8
C	40	2	60	6
D	25	3	40	4

Laspeyre's Index is

a) 166.04 b) 166.40

c) 164.04 d) 164.40

10) Which of the following index is computed by taking the average of base year and current year.

a) Marshall-Edgeworth Index

b) Paasche's Index

c) Laspeyre's Index d) Fisher's Index

11) The index number of prices for a country at a given date is 250 in comparison to the base period price, the price of all commodities in the country has increased by _____ times.

a) 1.25 b) 1.5 c) 2 d) 2.5

12) If Fisher's index number is 160 and Paasche's index numbers is 140, then Laspeyer's index number is

a) 147.77 b) 182.85

c) 183.35 d) 146.25

13) The number of words can be formed using the letters of the word 'SOFTWARE' so that vowels always coming together.

a) 720 b) 1440 c) 2880 d) 4320

14) Given that 74% canadian like grapes and 71% canadian like bananas then the percentage of canadians like both grapes and bananas if every body likes atleast one fruit is

a) 25% b) 35% c) 45% d) 60%

15) If xy = 1 then $y^2 + \frac{dy}{dx}$

a) 1 b) 0 c) - 1 d) ½

16) In the next world cup of cricket, there will be 12 teams, divided equally in to two groups. Teams of each group will play a match against other. From each group 3 top teams will qualify for the next round. In this round each team will play against others once. Four top teams of this round, will qualify for the semi final round, where each team will play against the others once. Two top teams of this round will go to final round, where they will play the best of three matches. How much minimum number of matches in the next world cup will be.

a) 54 b) 53 c) 38 d) 43

17) The following table represents the income of 86 persons.

Income	500-999	1000 - 1499	1500 - 1999	2000 - 2499
No. of persons	15	28	36	7

What is the percentage of persons earning at least ₹1,500 per _____.

a) 50% b) 45% c) 40% d) 60%

18) There are six persons A, B, C, D, E and F in a family. A and B are a married couple and A is a male member. D is the only son of C, who is the brother of A, E is the sister of D. B is the daughter-in-law of F, whose husband was dead. Who is the mother of C?

a) A b) E c) D d) F

19) For tabulation 'Caption' is

a) Upper part b) Lower part

c) Main part

d) Upper part of columns and sub columns.

20) For moderately skewed distribution marks in statistics for a group of 200 students mean mark and median mark were found to be 55.60 and 52.40 mode marks.

a) 54.48 b) 48 c) 53.56 d) 46

21) Weighted GM Satisfies _____ test while factor reversal test will be satisfied by _____.

a) Time reversal test, Fishers Idle Index number

b) Time reversal test, Laspeyers Index

c) Factor Reversal test, Paasches Index

d) Factor reversal test, Fishers Idle Index number

22) Find Population limits if r = 0.4 & n = 81

a) 0.3370, 03.4725 b) 0.338, 0.487

c) 0.347, 0.568 d) 0.462, 0.338

23) Spearmans rank corelation coefficient is given by

a) $1-\frac{6\sum d^2}{n(n^2-1)}$ b) $1-\frac{4\sum d^2}{n(n^2-1)}$

c) $1-\frac{6\sum d^2}{n(n^2+1)}$ d) $1-\frac{4\sum d^2}{n(n^2+1)}$

24) If the Regression equation x + 2y – 5 = 0 and 2x + 3y – 8 = 0 mean of x and mean of y

a) -3 and 4 b) 2 & 4

c) 1 and 2 d) 2 and 1

25) A committee of 3 women and 4 men is to be formed out of 8 women and 7 men. Mrs. Kajal refuses to serve in a committee in which Mr. Yash is a member. The number of such committees can be

a) 1530 b) 1500 c) 1520 d) 1540

26) The Nominal rate of interest is 10% per annum the interest is compounded quarterly. The effective rate of interest per annum will be.

a) 10% b) 10.10%

c) 10.25% d) 10.38%

27) If a car is available for Rs.4,98,200 cash payment or Rs.60,000 cash down payment followed by three equal annual instalments. If the rate of interest charged is 14% per annum compounded yearly. then total interest charged in the installment plan is?
Given p (3,0.14) = 2.32163

a) ₹ 1,46,314 b) ₹1,46,137

c) ₹ 1,58,040 d) ₹ 1,28,040

28) If $6_{p_{2r}} = 12 \times 6_{P_r}$ then r is equal to

a) 1 b) 2 c) 3 d) 4

29) How many numbers between 74 and 25556 which are divisible by 5 is

a) 5090 b) 5097 c) 5095 d) 5075

30) Neelima, who is the daughter of Deepak say to Deepika, yours mother-in-law Rekha is the youngest daughter of Ramlal, who is my grandfather. How is Deepika related to Neelima?

a) Niece b) Sister

c) Sister-in-law d) 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 & U. Q the lawyer is married to P. P has one son & 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 grandson of the following?

a) Lawyer b) Engineer
c) Student d) Doctor

32) Pointing to a photograph A Women's said. "this man's son's sister is my mother-in-law "How is Women's husband related to the man in the photograph?

a) Son b) Son-in-Law
c) Grandson d) Nephew

33) A is the brother of B, B is the daughter of C, and D is the father of A, then how is C related to D

a) Husband b) Wife
c) Grand Daughter d) Grand Father

34) For variable X and Y, we collect the four observations $\sum X = 10$; $\sum Y = 14$; $\sum X^2 = 65$; $\sum Y^2 = 5$; $\sum XY = 3$. What is regression line of Y on X?

a) Y = - 0.8X – 5.5 b) Y – 0.8X – 5.5
c) Y = -0.8X + 5.5 d) Y = 0.8X + 5.5

35) If a Poisson distribution is such that P(X-=2) = $\frac{1}{3}$ P (X=3), then the standard deviation of the distribution is:

a) $\sqrt{3}$ b) 3 c) 2 d) 1

36) If a random variable X has the following probability distribution, then the expected value of X is:

X	-1	-2	0	1	2
F(x)	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{3}$

a) $\frac{3}{2}$ b) $\frac{1}{2}$ c) $\frac{1}{6}$ d) $\frac{1}{3}$

37) The regression lines will be perpendicular to each other when value of r is _____.

a) 1 b) -1 c) ½ d) 0

38) If the discount rate is 10% per annum, how much amount would you pay to receive ₹ 2,500 growing at 8%, annually forever?

a) ₹ 1,25,000 b) ₹ 2,50,000
c) ₹ 1,50,000 d) ₹ 2,00,000

39) The C.I on ₹ 15,625 for 9 months at 16% p.a. when interest is compounded quarterly is:

a) ₹ 1,851 b) ₹ 1,941
c) ₹ 1,951 d) ₹ 1,961

40) Mr. Sharad got his retirement benefit amounting to ₹ 50,00,000. He want to receive a fixed monthly sum of amount for his rest of life, starting after one month and there after he wants to pass on the same to future generation. He expects to earn and interest of 9% compounded annually. Determine how much perpetuity amount he will receive every month?

a) ₹ 39,500 b) ₹ 38,500
c) ₹ 37,500 d) ₹ 36,600

41) Jonny wants have to Rs.2,00,000 in his savings account after 3 years. The rate of interest offered by bank 8% per annum compounded annually. How much should be invest today to achieve his target amount.

a) 1,47,489.10 b) 1,71,035.59
c) 1,58,766.44 d) 1,84,417.96

42) X is the husband of Y, W is the daughter of X, Z is husband of W, N is daughter of Z. Who is Y to N.

a) Cousin b) Niece
c) Daughter d) Grand Mother

43) Sunitha walks a distance of 2 km towards east and turns left and walks 1 km. then turns left and walks for 2 km and then turns left and walks for 1km then halts, at what distance Sunitha is now from the starting point?

a) 0 km b) 1 km
c) 2 km d) 5 km

44) Six friends A, B, C, D, E & F sitting around a circular table facing centre. E is not between B & D, A is to the left of F, C is fourth to the right of A, D is immediate right of E, then who sits second to the right of F?

a) C b) A c) D d) B

45) Based on the statements give below, find out who is the uncle of P?

i) K and J are brothers

ii) K's sister is M

iii) P and N are siblings

iv) N is the daughter of J

a) K b) M c) N d) None

46) Four persons are chosen at random from a group of 3 men, 2 women and 4 children. The probability that exactly 2 of them are children is.

a) $\frac{10}{21}$ b) $\frac{1}{12}$ c) $\frac{1}{5}$ d) $\frac{1}{9}$

47) The incidence of skin disease in a chemical plant occurs in such the workers have 20% of change of suffering from it. What is the probability of 6 workers 4 or more will have skin disease.

a) 0.1696 b) 0.01696

c) 0.1643 d) 0.01643

48) If P(A) = 1/3, P(B) = ¼ and P(A/B) = 1/6, Then P(B/A) is

a) 1/8 b) ¼ c) 3/8 d) ½

49) Ms. Paul invested Rs.1,00,000 in a mutual fund scheme in January 2018 after one year in January 2019, She got a dividend amounting to Rs.10,000 for the first year Rs.12,000 for second year, Rs.16,000 for third year, Rs.18,000 for fourth year Rs.21,000 for fifth year in January 2023. What is compounded Annual growth rate (CAGR) of dividend return? $(1.2038)^4 = 2.1$

a) 20.38% b) 18.59%

c) 16.36% d) 15.89%

50) Suppose you have decided to make a Systematic Investment Plan (SIP) in a mutual fund with Rs.1,00,000 every year from today for next 10 years where you get return of 10% per annum compounded annually. What is the future value of annuity? Given $(1.1)^{10} = 2.59374$

a) Rs.17,35,114 b) Rs.17,53,411

c) Rs.17,35,411 d) Rs.17,53,116

51) Mr. Ram invested a total of ₹ 1,00,000 in two different banks for a fixed period. First bank yields an interest of 9% per annum and second 11% per annum, if the total interest at the end of one year is 9.75% per annum S.I. Then the amount invested in the two banks respectively are.

a) ₹ 52,500, ₹ 47500

b) ₹ 62,500, ₹ 37,500

c) ₹ 57500, ₹ 42,500

d) ₹ 67500, ₹ 32,500

52) A company wants to replace the machinery at the end of the 10 years. Expected cost of machine would be ₹ 10,00,000. If the management of the company has to maintain a sinking fund. How much provision needs to be make out of profits each year which can earn at the rate of 10% compounded annually. Find the amount of each annual deposit (Given A (10,0.10) = 15.937425)

a) ₹ 74,635 b) ₹ 72, 514

c) ₹ 62, 745 d) ₹ 67,245

53) Seven friends A, B, C, D, E, F and G are watching TV. E is at extreme end, C is sitting second to E, B is sitting between C and A. G is not at extreme end. A is not at any extreme end and D is sitting immediate to F, then who is sitting at middle.

a) A b) B c) C d) F

54) Deepika starts walking straight towards east. After walking 65M turns to left and walks 25 m straight. Again she turns to the left and walked a distance of 40 m. At what distance and in which direction currently she is from the starting point?

a) 35.35M in North-East

b) 35.35M in South - West

c) 25M in North d) 25M in West

55) Mr. Karthik puts his tune piece on the table in such a way that at 6 pm hours hand points to north. In which direction the minute hand will point at 9.15 pm?

a) East b) West c) North d) South

56) Srikanth is facing East and turns 120^0 in the clock wise direction and then 180^0 in the anti-clock wise direction. Which direction is Srikanth facing now?

a) East b) North - East

c) North d) South - West

57) Company 'A' produces 10% defective products, company 'B' produces 20% defective products and company 'C' produces 5% defective products. If choosing a company is an equally likely event. What is probability is that a product chosen is free from defect?

a) 0.88 b) 0.80 c) 0.79 d) 0.78

58) Between 9 AM & 10 AM the average number of phone call per minute coming into the switchboard of a company is 4. Find the probability during a particular minute there will be either 2 phone calls or no phone calls. ($e^{-4} = 0.0183$).

a) 0.156 b) 0.165 c) 0.149 d) 0.194

59) The probability distribution of x is given below

Value of x	1	0	Total
Probability	P	1-p	1

Mean is equal to

a) p b) 1-p c) 0 d) 1

60) For any two events A and B it is known that $P(A) = 2/3$, $P(B) = 3/8$ and $P(A \cap B) = ¼$. Then the events A and B are

a) Mutually exclusive and independent

b) Mutually not exclusive and independent

c) Mutually exclusive but not independent

d) Neither independent nor mutually exclusive

61) A machine depreciates at 10% of its value at the beginning of the year which the cost and scrap value realized at the time of sale being ₹ 23,240 and ₹ 9,000. Then approximately for how many years the machine put to use.

a) 7yrs b) 8yrs c) 9yrs d) 10yrs

62) The difference between C.I and S.I on a certain sum of money invested for 3 years at the rate of 6% per annum is Rs.110.16 then principle is

a) ₹ 3,000 b) 3,700

c) 10,000 d) 12,000

63) The population of a town increases every year by 2% of the population at the beginning of the year. The approximate number of years by which the total increase of population will be 40% is. Given $(1.02)^8 = 1.17160$

a) 15y b) 17y c) 19y d) 20y

64) Govinda's mother decides to gift him Rs.50,000 every year starting from today for the next 5 years. Govinda deposits this amount in a bank as and when he receive and gets 10% per annum interest rate compounded annually. What is the present value of the annuity?

Given P (4,0.10) = 3.16987

a) ₹ 2,80,493.5 b) ₹ 2,08,493.5

c) ₹ 2,08,914.5 d) ₹ 2,58,493.5

65) Find the next number in the series: QIF, S2E, U6D, W21C, ...?

a) Y66B b) Y44B

c) Y88B d) Z66B

66) Five boys Ajay, Brijmohan, Chandru, Dheeraj and Ehsan are sitting in a park around a circle facing the center, Ajay is facing South-West, Dheeraj is facing South-East, Brijmohan and Ehsan are right opposite Ajay and Dheeraj respectively, Chandru is equidistance between Dheeraj and Brijmohan. Which direction is Chandru facing?

a) West b) South

c) North d) East

67) Pran, Komal, Ravi, Shalu, Trilok, Urvi, Chandru and Walter are sitting in a row facing North.

i) Pran is forth to the right of Trilok.

ii) Walter is forth to the left of Shalu.

iii) Ravi and Urvi which are not at the ends are neighbours of Komal and Trilok.

iv) Walter is immediate left of Pran and Pran is the neighbour of Komal.

Identify who are seating at the extreme ends.

a) Pran & Walter b) Trilok & Urvi

c) Trilok & Shalu d) Shalu & Pran.

68) Find the Odd man of the following series

190, 145, 136, 352, 460, 324, 631, 249?

a) 136 b) 244 c) 460 d) 324

69) The probability that a four-digit number comprising the digits 2, 5, 6 and 7 with repetition of digits would be divisible by 4 is.

a) ½ b) ¾ c) ¼ d) 1/3

70) The Geometric Means of 3, 7, 11, 15, 24, 28, 30, 0 is _____.

a) 6 b) 0 c) 9 d) 12

71) If the first quartile is 42.75 and the third quartile is 74.25, then the _____ quartile deviation is:

a) 29.62 b) 15.75

c) 17.57 d) 25.92

72) On a commodity exchange when booking trades with provision for stop – trader can make a profit of rupees 50,000 or incur a loss of rupees 20,000. The probability of making profit and incurring loss is 0.75 and 0.25 respectively. The expected profit for the trader should be _____.

a) ₹ 32, 500 b) ₹35, 000

c) ₹ 30,000 d) ₹35, 500

73) If α and β are roots of the quadratic equation $x^2 - 2x - 3 = 0$,then the equation whose roots are α + β and α – β is.

a) $x^2 - 6x - 8 = 0$ b) $x^2 - 6x + 8 = 0$

c) $x^2 + 6x + 8 = 0$ d) $x^2 + 6x - 8 = 0$

74) The value of $[\log_{10}(5 \log_{10}100)]^2$ is:

a) 1 b) 2 c) 10 d) 25

75) If $\sqrt[3]{a} + \sqrt[3]{b} + \sqrt[3]{c} = 0$ then the value of $\left(\frac{a+b+c}{3}\right)^3$ is equal to

a) abc b) 9 abc

c) 1/(abc) d) (1/9)abc

76) The largest side of a triangle is 3 times the shortest side and the third side is 4 cm shorter than the largest side. If the perimeter of the triangle is at least 59 cm, what is the length of the shortest side?

a) Less than 7 cm

b) Greater than or equal to 7 cm

c) Less than 9 cm

d) Greater than or equal to 9 cm

77) If α and β are the roots of the equation $x^2 - (n^2+1)x + \frac{1}{2}(n^4 + n^2 + 1) = 0$ then the value of $\alpha^2 + \beta^2$ is

a) 2n b) n^2 c) $2n^2$ d) n^3

78) The number in the place of question mark in 7, 26, 63, 124, 215, ___, 511

a) 342 b) 343 c) 441 d) 421

79) If $Y = \frac{x}{x+5}$ then $\frac{dx}{dy}$

a) $\frac{5}{(1-y)^2}$ b) $\frac{5}{(1+y)^2}$

c) $\frac{3}{(1-y)^2}$ d) $\frac{3}{(y+1)^2}$

80) In a certain code, MENTION is written as "LNEITNO". How is PRESENT in that code?

a) OFSFTUM b) ONESERO

c) QRESTNO d) OERESTN

81) Out of the following 41, 43, 47, 53, 61, 71, 83, 95 the odd man out shall be

a) 95 b) 83 c) 71 d) 53

82) Mean deviation about mean for the data 12, 16, 24, 30, 35, 39, 40.

a) 9.14 b) 9.44 c) 8.94 d) 9.84

83) 24, 18, 36, 42, 30, 28, 24, 29, 25, 33 then median.

a) 26.5 b) 27.5 c) 28.5 d) 29.5

84) What does an Ogive curve represent?

a) The Cumulative frequency & class boundary

b) The frequency & class boundary

c) the frequency & cumulative frequency

d) the frequency & class interval

85) Find the mode of the following data

X	25-30	30-35	35-40	40-45	45-50	50-55
f(x)	20	53	42	42	41	43

a) 31.75 b) 30.75 c) 33.75 d) 35.75

86) If the standard deviation of data 2, 4, 6, 8, 17, is 4.47 then find SD for the data 4, 8, 10, 12, 16, 34, is

a) 4.47 b) 8.94 c) 13.44 d) 2.24

87) In a garment factory, on an average experienced tailor can stich 5 shirts, while the in-experienced tailor can stich 3 shirts daily but the employer has to maintain minimum of 30 shirts stretched per day. This can be formulated as

a) $5x + 3y \leq 30$ b) $5x + 3y \geq 30$

c) $5x + 3y \geq 30\ x \geq 0\ y \geq 0$

d) $5x + 3y \leq 30\ x \leq 0\ y \leq 0$

88) If the age of a man is four times to the sum of ages of his two sons. After ten years his age will be double the sum of their ages. What is the present age of the man is.

a) 56 b) 45 c) 60 d) 64

89) Given that $\log_{10} x = m + n - 1$, $\log_{10} y = m - n$ then the value of $\log_{10}(100x/y^2)$ expressed in terms of m and n is

a) 1 – m + 3n b) m + 3n – 1

c) m + 3n + 1 d) $m^2 - n^2$

90) A fertilizer company produces two types of fertilizers called Grade I and Grade II. Each of these types is processed through a chemical plant unit. The maximum of 180 hours available in a week. Manufacturing one bag of grade I fertilizer requires 4 hours in the plant. Manufacturing one bag of Grade II requires 10 hours in the plant. Express this using liner inequalities.

a) $2x_1 + 5x_2 \leq 180$

b) $4x_1 + 10x_2 > 180$

c) $2x_1 + 5x_2 > 180$

d) $4x_1 + 10x_2 \leq 180$

91) If $x = y^a$, $y = z^b$, $z = x^c$ then abc = ?

a) 1 b) 2 c) 3 d) 4

92) Let R be a relation defind on the set of natural numbers as "xRy"$\Leftrightarrow$ (x-y) is divisible by 5 $\forall x,y \in N$ then the relation R is.

a) Equivalence

b) Antisymmetric

c) Symmetric but not transitive

d) Symmetric but not reflexive

93) If the 4^{th}, 7^{th} & 10^{th} terms on G.P are p,q,r respectively then

a) $P^2 = q^2 + r^2$ b) $p^2 = qr$

c) $q^2 = pr$

d) pqr + pq + 1 = 0

94) If A = {a, b, c}, B = {b, c, d} and C = {a, d, c} the (A - B) x (B $\cap$ C) is equal to

a) {(a, d), (c, d)}

b) {(a, c), (a, d)}

c) {(c, a), (d, a)}

d) {(a, c), (a, d) (b, d)}

95) If $f(x) : N \rightarrow R$ is a function defend as $f(x) = 4x + 3$, $\forall x \in N$, then $f^{-1}(x) = C$

a) $4 + \frac{x+3}{4}$ b) $\frac{x+3}{4}$

c) $\frac{x-3}{4}$ d) $\frac{3x+4}{4}$

96) The Mode of presentation of data are:

a) Textual, Diagrammatic and Internal presentation

b) Tabular, Textual and Internal Presentation

c) Textual, Tabular and Diagrammatic presentation

d) Tabular, Diagrammatic and Internal Presentation

97) The mean and variance of group of 100 observations are 8 and 9, the mean and standard deviation of 60 observations are 10 and 2 respectively, find the standard deviation of remaining 40 observations.

a) 4.5 b) 3.5 c) 2.5 d) 1.5

98) For a given data set: 5, 10, 3, 6, 4, 8, 9, 3, 15, 2, 9, 4, 19, 11, 4, what is median?

a) 8 b) 6 c) 4 d) 9

99) If the mean of two numbers is 30 and geometric mean is 24 then what will be the harmonic mean of two numbers?

a) 19.2 b) 21.8 c) 22.3 d) 18.4

100) For a given set of normally distributed data, the following statistical parameters observed: Mean = 6, standard deviation = 2.6, Median = 5 and Quartile deviation = 1.5. then coefficient of Quartile deviation is equals to

a) 30 b) 32 c) 25 d) 39

THE END