Test Series: October 2021

MOCK TEST PAPER 1

FOUNDATION COURSE

PAPER 3: BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS

Time: 2 Hours **Marks: 100**

Part A: Business Mathematics and Logical Reasoning

1. If x: y = 3:5, then find $\left(\frac{1}{x}+\frac{1}{y}\right):\left(\frac{1}{x}-\frac{1}{y}\right)$

   (a) 2

   (b) 4

   (c) 6

   (d) 8

2. if A: B = 3:5 and B:C= 5:4 , C:D = 2:3 and D is 50% more than E, find the ratio between A and E

   (a) 2:3

   (b) 3:4

   (c) 3:5

   (d) 4:5

3. Find the value of $\sqrt{6561}+\sqrt[4]{6561}+\sqrt[8]{6561}$

   (a) 81

   (b) 93

   (c) 121

   (d) 243

4. Find the value of $\log\frac{x^n}{y^n}+\log\frac{y^n}{z^n}+\log\frac{z^n}{x^n}$

   (a) -1

   (b) 0

   (c) 1

   (d) 2

5. If $\frac{8^n\times 2^3\times 16^{-1}}{2^n\times 4^2}=\frac{1}{4}$ then the value of n

   (a) 1

   (b) 3

   (c) $\frac{3}{2}$

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

6. Given the Quadratic Equation $\frac{x+1}{x}-\frac{x}{x+1}=\frac{3}{2}$

   (a) 1 and -2/3

   (b) -1 and 2/3

   (c) -1 and -2/3

   (d) 1 and 2/3

7. A dealer has only ₹ 5760 to invest in fans (x) and sewing machines (y). The cost per unit of fan and sewing machine is ₹360 and ₹ 240 respectively. This can be shown by:

   (a) $360x + 240y \geq 5760$

   (b) $360x + 240y \leq 5760$

   (c) $360x + 240y = 5760$

   (d) none of these

8. The point of intersection between the lines $3x+ 4y = 7$ and $4x –y = 3$ lie in the

   (a) 1st quadrant.

   (b) 2nd quadrant.

   (c) 3rd quadrant

   (d) 4th quadrant.

9. The roots of equation $9^{x+2} – 6.3^{x+1} + 1 = 0$ are

   (a) -2

   (b) 2

   (c) $\sqrt{2}$

   (d) 0

10. The roots of the equation $x^2-x+1=0$ are

    (a) Imaginary and unequal

    (b) Real and unequal

    (c) Real and equal

    (d) Imaginary and equal

11. 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

12. If $\sqrt{1+\frac{25}{144}}=1+\frac{x}{12}$, then x is

    (a) 1

    (b) 2

    (c) 3

    (d) 0

13. A sum of ₹46,875 was lent out at simple interest and at the end of 1 year 8 months, the total amount was ₹ 50,000. Find the rate of interest per annum.

    (a) 8%

    (b) 4%

    (c) 12%

    (d) None

14. A sum of money amount to ₹ 6,200 in 2 years and ₹ 7,400 in 3 years. The principal and rate of interest are

    (a) ₹ 3,800, 31.57%

    (b) ₹ 3,000, 20%

    (c) ₹ 3,500, 15%

    (d) none of these

15. The effective rate of interest corresponding to a nominal rate 3% p.a payable half yearly is

    (a) 3.2% p.a

    (b) 3.25% p.a

    (c) 3.0225% p.a

    (d) none of these

16. A sum of money gets doubled in 5 years at X% simple interest. If the interest was Y%, the sum of money would have become ten-fold in thirty years. What is Y – X (in %)

    (a) 10

    (b) 5

    (c) 8

    (d) None of the above

17. The nominal rate of growth is 17% and inflation is 9% for the five years. Let P be the Gross Domestic Product (GDP) amount at the present year then the projected real GDP after 6 years is

    (a) 1.587P

    (b) 1.921 P

    (c) 1.403 P

    (d) 2.51 P

18. The difference between Compound Interest and Simple Interest on a certain sum for 2 years at 6% p.a. is ₹ 13.50. Find the sum

(a) 3750

(b) 2750

(c) 4750

(d) none

19. The sum required to earn a monthly interest of Rs 1200 at 18% per annum Simple Interest is

(a) ₹ 50,000

(b) ₹ 60,000

(c) ₹ 80,000

(d) none of these

20. The compound interest earned by a money lender on ₹ 7,000 for 3 years if the rate of interest for 3 years are 7%, 8% and 8.5% respectively is

(a) ₹ 1750

(b) ₹1800

(c) ₹ 1776

(d) none of these

21. Find the present value of an annuity of ₹ 1,000 payable at the end of each year for 10 years, if the money is worth 5% effective.

(a) ₹ 7,724

(b) ₹ 7000

(c) ₹ 8000

(d) none of these

22. The present value of annuity of ₹3,000 per annum for 15 years at 4.5% p.a C.I. annually is

(a) ₹ 23,809.41

(b) ₹ 32,214.60

(c) ₹ 32,908.41

(d) none of these

23. A person desires to create a fund to be invested at 10% CI per annum to provide for a prize of ₹ 300 every year. Using V = a/I find V and V will be

(a) ₹ 2,000

(b) ₹ 2,500

(c) ₹ 3,000

(d) none of these

24. The future value of annuity of ₹2000 for 5 years at 5 % compounded annually is given (in nearest ₹) as

(a) ₹ 11, 051

(b) ₹ 21,021

(c) ₹ 1,56,24

(d) ₹ 61254

25. A Maruti Zen cost ₹ 3,60,000. Its price depreciates at the rate of 10% of a year during the first two years and at the rate of 20% in third year. Find the total depreciation.

    (a) ₹ 1,26,720

    (b) ₹ 1,15,620

    (c) ₹ 1,25,000

    (d) ₹ 1,10,520

26. Find the value of n if (n+1)! = 42 (n–1)!

    (a) 6

    (b) -7

    (c) 7

    (d) -6

27. If ${}^{n}P_{13} : {}^{n+1}P_{12} = 3 : 4$ then value of n is

    (a) 15

    (b) 14

    (c) 13

    (d) 12

28. A question paper contains 6 questions, each having an alternative. The number of ways an examiner can answer one or more questions is

    (a) 720

    (b) 728

    (c) 729

    (d) none of these

29. ${}^{5}C_{1} + {}^{5}C_{2} + {}^{5}C_{3} + {}^{5}C_{4} + {}^{5}C_{5}$ is equal to _____

    (a) 30

    (b) 31

    (c) 32

    (d) 35

30. The second term of a G P is 24 and the fifth term is 81. The series is

    (a) 16, 36, 24, 54…..

    (b) 24, 36, 53… …

    (c) 16, 24, 36, 54,……

    (d) none of these

31. The sum of progression (a+b), a, (a–b).....n term is

    (a) $\frac{n}{2}[2a+(n-1)b]$

    (b) $\frac{n}{2}[2a+(3-n)b]$

(c) $\frac{n}{2}[2a+(3-n)]$

(d) $\frac{n}{2}[2a+(n-1)]$

32. The series $1+10^{-1}+10^{-2}+10^{-3}....$ to ∞ is

(a) 9/10

(b) 1/10

(c) 10/9

(d) none of these

33. Find the sum of first twenty-five terms of A.P. series whose n^{th} term is $\left(\frac{n}{5}+2\right)$.

(a) 105

(b) 115

(c) 125

(d) 135

34. Find *g o f* for the functions f (x) = $\sqrt{x}$, g (x) = $2x^2+1$

(a) $2x^2+1$

(b) 2x+1

(c) $2x^2+1)$ ($\sqrt{x}$)

(d) $\sqrt{x}$

35. If $f(x)=x^2-1$ and $g(x)=\frac{x+1}{2}$, then $\frac{f(3)}{f(3)+g(3)}$ is

(a) 5/4

(b) 4/5

(c) 3/5

(d) 5/3

36. If A = {2,3}, B = {4,5}, C = {5,6} then AX (B$\cap$C) is

(a) {(2,5), (3,5)}

(b) {(4,2), (4,6)}

(c) {(4,3), (4,2)}

(d) none of these

37. if $f(x) = x^2/e^x$, then $f'(-1)$ is equal to

(a) -3e

(b) 1/e

(c) e

(d) none of these

38. If $y = e^{\sqrt{2x}}$, $\frac{dy}{dx}$ is calculated as

(a) $\frac{e^{\sqrt{2x}}}{\sqrt{2x}}$

(b) $e^{\sqrt{2x}}$

(c) $\frac{e^{\sqrt{2x}}}{\sqrt{2x}}$

(d) none of these

39. Evaluate: $\int_0^5 \frac{x^2}{x^2+(5-x)^2}dx$

(a) 2.5

(b) 0

(c) -1

(d) 2

40. Evaluate: $\int\left\{\frac{1}{\log x} - \frac{1}{(\log x)^2}\right\}dx$

(a) $\frac{1}{\log x}+c$

(b) $\frac{x}{\log x}+c$

(c) $-\frac{x}{\log x}+c$

(d) None of these

41. Find next term of the series 3,10,29,66, 127,?

(a) 164

(b) 187

(c) 216

(d) 218

42 Which number should come next 7, 26,63,124,215, 342,?

(a) 391

(b) 421

(c) 481

(d) 511

43 Find out the wrong number. 10,14,28,32,64,68,132

(a) 28

(b) 32

(c) 64

(d) 132

44. In a certain code 'SOUTHERN' is written as 'UVPTMQDG'. How is 'MARIGOLD' written in that code?

(a) JSBCNFKS

(b) JSBNHPME

(c) JSBNCKNF

(d) NBSKCJNF

45. In a certain code 'PRISM' is written as 'OSHTL' and 'RUBLE' is written as 'QVAMD'. How will 'WHORL' be written in that code?

(a) XISPM

(b) VINSK

(c) UINSK

(d) XGPQM

46 A is the son of C; C and Q are the sisters; Z is the mother of Q and P is the son of Z. Which of the following statements is true?

(a) A and P are cousins

(b) C and P are sisters

(c) P is the maternal uncle of A

(d) A is the maternal uncle of P

47. 'X @ Y' means 'X is the mother of Y;

'X $ Y' means 'X is the husband of Y;

'X # Y' means 'X is the sister of Y'.

'X * Y' means 'X is the son of Y'.

Which of the following indicates the relationship 'A is daughter of P'?

(a) P @ B # F * A

(b) P @ B # A * F

(c) A # F * B @ P

(d) A # F * B $ P

(From Q.48 to Q.49) Read the following information carefully and answer the questions given below?

There are six children playing football, namely P, Q, R, S, T and U. P and T are bothers, U is sister of T, R is the only son of P's uncle, Q and S are the daughters of the only brother of R's father

48. How many female players are there?

(a) one

(b) two

(c) three

(d) Four

49. How is S is related to P

(a) Uncle

(b) Sister

(c) Niece

(d) Cousin

50. Pointing towards photograph. Vinod said, “she is the daughter of my wife’s mother’s only daughter”. How is Vinod is related to the girl in the Photograph?

(a) Cousin

(b) Uncle

(c) Father

(d) None

51. Raju walks northwards. After a while, he turns to his right and a little further to his left. Finally, after walking a distance of one kilometre, he turns to his left again. In which direction is he moving now?

(a) North

(b) South

(c) East

(d) West

52. Ravi wants to go to the College. He starts from his home, which is in the East and comes to a crossing. The road to the left ends in a theatre, straight ahead is the hospital. In which direction is the College?

(a) North

(b) South

(c) East

(d) West

53. A man is facing south. He turns 135° in the anticlockwise direction and then 180° in the clockwise direction. Which direction is he facing now?

(a) North-East

(b) North-West

(c) South-East

(d) South-West

54. Rakesh moves towards South-East a distance of 7 m, then he moves towards West and travels a distance of 14 m. From here he moves towards North-West a distance of 7 m and finally he moves a distance of 4 m towards East and stood at that point. How far is the starting point from where he stood?

(a) 3 m

(b) 4 m

(c) 10 m

(d) 11 m

55. A and B start moving towards each other from two places 200 m apart. After walked 60 m, B turns left and goes 20 m, then he turns right and goes 40 m. He then turns right again and comes back to the road on which he had started walking. If A and B walk with the same speed, what is the distance between them now?

    (a) 20 m

    (b) 30 m

    (c) 40 m

    (d) 50 m

(56-58) Study the following information carefully to answer the questions given below. P, T, V, R, M, D, K and W are sitting around a circle table facing the centre. V is second to the left of T. T is fourth to the right of M. D and P are not immediate neighbours of T. D is third to the right of P. W is not an immediate neighbour of P. P is to the immediate left of K.

56. Who is Second to the left of K?

    (a) P

    (b) R

    (c) M

    (d) W

57. Who is the immediate left of V?

    (a) D

    (b) M

    (c) W

    (d) None of these

58. What is R's Position with respect to V?

    (a) Third to the right

    (b) Fifth to the right

    (c) Third to the left

    (d) Second to the left

59. 8 Persons A, B, C, D, E, F, G and H are sitting in two rows opposite to each other. Each row has four persons. B and C are sitting in front of each other. C is between D and E. H is sitting immediate left of E. H and F are diagonally opposite. G and B are not near to each other. Who is in front of A?

    (a) E

    (b) D

    (c) C

    (d) B

60. A group of seven singers, facing the audience, are standing in a line on the stage as follow.

    (i) D is the right of C.

    (ii) F is stand beside G.

    (iii) B is to the left of F.

    (iv) C and B are one person between them.

    (Vi) A and D have one person between them.

Who is sitting on the second from extreme right?

(a) D

(b) F

(c) G

(d) E

Part B: Statistics

61. Statistics is concerned with

(a) Qualitative information

(b) Quantitative information

(c) (a) or (b)

(d) Both (a) and (b).

62. The primary data are collected by

(a) Interview method

(b) Observation method

(c) Questionnaire method

(d) All these.

63. The following data relate to the incomes of 86 persons:

Income in ₹	:	500–999	1000–1499	1500–1999	2000–2499
No. of persons	:	15	28	36	7

What is the percentage of persons earning more than Rs? 1500?

(a) 50

(b) 45

(c) 40

(d) 60

64. The following data relate to the marks of a group of students:

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

How many students got marks more than 30?

(a) 65

(b) 50

(c) 35

(d) 43

65. The curve obtained by joining the points, whose x- coordinates are the upper limits of the class-intervals and y coordinates are corresponding cumulative frequencies is called

(a) Ogive

(b) Histogram

(c) Frequency Polygon

(d) Frequency Curve

66. If x and y are related by x–y–10 = 0 and mode of x is known to be 23, then the mode of y is

(a) 20

(b) 13

(c) 3

(d) 23

67. If there are two groups with 75 and 65 as harmonic means and containing 15 and 13 observations then the combined HM is given by

(a) 65

(b) 70.36

(c) 70

(d) 71

68. If the quartile deviation of x is 6 and 3x + 6y = 20, what is the quartile deviation of y?

(a) 3

(b) 4

(c) 5

(d) 6

69. Which one is an absolute measure of dispersion?

(a) Range

(b) Mean Deviation

(c) Standard Deviation

(d) All these measures

70. The median of 27, 30, 26, 44, 42, 51, 37 is

(a) 30

(b) 42

(c) 44

(d) 37

71. Mean of 25,32,43,53,62,59,48,31,24,33 is

(a) 44

(b) 43

(c) 42

(d) 41

72. If the A.M of any distribution be 25 & one term is 18. Then the deviation of 18 from A.M is

(a) 7

(b) -7

(c) 43

(d) none

73. The algebraic sum of the deviations of a frequency distribution from its mean is always,

(a) greater than zero

(b) less than zero

(c) zero

(d) a non-zero number

74. Pooled Mean is also called

(a) Mean

(b) Geometric Mean

(c) Grouped Mean

(d) none

75. If x and y are related by y = 2x+ 5 and the SD and AM of x are known to be 5 and 10 respectively, then the coefficient of variation of y is

(a) 25

(b) 30

(c) 40

(d) 20

76. Following are the wages of 8 workers in rupees: 50, 62, 40, 70, 45, 56, 32, 45. If one of the workers is selected at random, what is the probability that his wage would be lower than the average wage?

(a) 0.625

(b) 0.500

(c) 0.375

(d) 0.450

77. Given that for two events A and B, P (A) = 3/5, P (B) = 2/3 and P (AUB) = 3/4, what is P (A/B)?

(a) 0.655

(b) 13/60

(c) 31/60

(d) 0.775

78. A problem in probability was given to three CA students A, B and C whose chances of solving it are 1/3, 1/5 and 1/2 respectively. What is the probability that the problem would be solved?

(a) 4/15

(b) 7/8

(c) 8/15

(d) 11/15

79. A packet of 10 electronic components is known to include 2 defectives. If a sample of 4 components is selected at random from the packet, what is the probability that the sample does not contain more than 1 defective?

(a) 1/3

(b) 2/3

(c) 13/15

(d) 3/15

80. The probability that there is at least one error in an account statement prepared by 3 persons A, B and C are 0.2, 0.3 and 0.1 respectively. If A, B and C prepare 60, 70 and 90 such statements, then the expected number of correct statements

(a) 170

(b) 176

(c) 178

(d) 180

81. A bag contains 6 white and 4 red balls. If a person draws 2 balls and receives ₹ 10 and ₹ 20 for a white and red balls respectively, then his expected amount is

(a) ₹ 25

(b) ₹ 26

(c) ₹ 29

(d) ₹ 28

82. What is the first quartile of X having the following probability density function?

$$f(x) = \frac{1}{\sqrt{72\pi}} e^{\frac{-(x-10)^2}{72}} \quad \text{for } -\infty < x < \infty$$

(a) 4

(b) 5

(c) 5.95

(d) 6.75

83. If the points of inflexion of a normal curve are 40 and 60 respectively, then its mean deviation is

(a) 40

(b) 45

(c) 50

(d) 60

84. If X follows normal distribution with $\mu = 50$ and $\sigma = 10$, what is the value of

$P(x \leq 60 / x > 50)$?

(a) 0.8413

(b) 0.6828

(c) 0.1587

(d) 0.7256

85. 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 per cent area of the normal curve? [Given $\varphi(1.30) = 0.9032$.]

(a) 740

(b) 750

(c) 656

(d) 800

86. If the mean deviation of a normal variable is 16, what is its quartile deviation?
    (a) 10.00.
    (b) 13.50.
    (c) 15.00.
    (d) 12.05.
87. For a Poisson variate X, P (X = 1) = P (X = 2). What is the mean of X?
    (a) 1.00.
    (b) 1.50.
    (c) 2.00.
    (d) 2.50.
88. For a Poisson distribution,
    (a) mean and standard deviation are equal.
    (b) mean and variance are equal.
    (c) standard deviation and variance are equal.
    (d) both (a) and (b).
89. The variance of a binomial distribution with parameters n and p is
    (a) $np^2 (1 – p)$.
    (b) $\sqrt{np(1-p)}$
    (c) $nq (1 – q)$
    (d) $n^2p^2 (1– p)^2$
90. For a p x q classification of bivariate data, the maximum number of conditional distributions is
    (a) p
    (b) p + q
    (c) pq
    (d) p or q
91. For a p x q bivariate frequency table, the maximum number of marginal distributions is
    (a) p
    (b) p + q
    (c) 1
    (d) 2
92. If the coefficient of correlation between two variables is 0.7 then the percentage of variation unaccounted for is
    (a) 70%
    (b) 30%
    (c) 51%
    (d) 49%

93. If the covariance between two variables is 20 and the variance of one of the variables is 16, what would be the variance of the other variable?

(a) $S^2y \geq 25$

(b) More than 10

(c) Less than 10

(d) More than 1.25

94. If the regression line of y on x and of x on y are given by $2x + 3y = -1$ and $5x + 6y = -1$ then the arithmetic means of x and y are given by

(a) (1, –1)

(b) (–1, 1)

(c) (–1, –1)

(d) (2, 3)

95. _____ satisfies circular test

(a) G.M. of price relatives or the weighted aggregate with fixed weights

(b) A.M. of price relatives or the weighted aggregate with fixed weights

(c) H.M. of price relatives or the weighted aggregate with fixed weights

(d) none

96. From the following data for the 5 groups combined

Group	Weight	Index Number
Food	35	425
Cloth	15	235
Power & Fuel	20	215
Rent & Rates	8	115
Miscellaneous	22	150

The general Index number is

(a) 270

(b) 269.2

(c) 268.5

(d) 272.5

97. Laspyres formula does not satisfy

(a) Factor Reversal Test

(b) Time Reversal Test

(c) Circular Test

(d) All the above

98. If $\Sigma P_0Q_0 = 1360$, $\Sigma P_nQ_0 = 1900$, $\Sigma P_nQ_n = 1880$ then the Laspeyre's Index number is

(a) 71

(b) 139.71

(c) 175

(d) None of these.

99. The consumer price Index for April 1985 was 125. The food price index was 120 and other items index was 135. The percentage of the total weight of the index is

(a) 66.67

(b) 68.28

(c) 90.25

(d) None of these.

100. Net monthly salary of an employee was ₹ 3000 in 1980. The consumer price index number in 1985 is 250 with 1980 as base year. If the has to be rightly compensated then, 7th dearness allowances to be paid to the employee is :

(a) ₹ 4.800

(b) ₹ 4,700

(c) ₹ 4,500

(d) None of these.