MOCK TEST PAPER II

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 = 2:3, then (5x+2y): (3x-y) =

   (a) 19: 3

   (b) 16:3

   (c) 7:2

   (d) 7:3

2. If $(25)^{150} = (25x)^{50}$, then the value of x will be:

   (a) 5^3

   (b) 5^4

   (c) 5^2

   (d) 5

3. The value of $\left(\frac{y^a}{y^b}\right)^{a^2+ab+b^2} \times \left(\frac{y^b}{y^c}\right)^{b^2+bc+c^2} \times \left(\frac{y^c}{y^a}\right)^{c^2+ca+a^2}$ is equal to

   (a) y

   (b) -1

   (c) 1

   (d) None of these

4. If $x = \log_{24} 12, y = \log_{36} 24, z = \log_{48} 36$ then $xyz + 1 =$

   (a) 2xy

   (b) 2xz

   (c) 2yz

   (d) 2

5. A person has asset worth of ₹ 1,48,200. He wish to divide it amongst his wife, son and daughter in the ratio 3:2:1respectively . From this assets share of his wife son will be :

   (a) ₹ 24,700

   (b) ₹ 49, 400

   (c) ₹ 74,100

   (d) ₹ 37,050

6. X, Y, Z together starts a business, if X invests 3 times as much as Y invests and Y invests two third of what Z invests, then the ratio of capitals of X,Y, Z is

   (a) 3:9:2

   (b) 6:3:2

   (c) 3:6:2

   (d) 6:2:3

7. If the ratio of the roots of the equation $4x^2-6x+p=0$ is 1:2 then the value of p is:

   (a) 1

   (b) 2

   (c) -2

   (d) -1

8. If roots of equation $x^2+x+r= 0$ are α and β and $\propto^3+\beta^3= -6$. Find the value of 'r'

   (a) -5/3

   (b) 7/3

   (c) -4/3

   (d) 1

9. If $2^{x+y} = 2^{2x+y} = \sqrt{8}$ then the respective values of x and y are ___

   (a) 1, ½

   (b) ½, 1

   (c) ½, ½

   (d) None of these

10. If $a^2+ b^2 = 45$ and ab = 18, the $\frac{1}{a}+\frac{1}{b}$ is:

    (a) ± 1/3

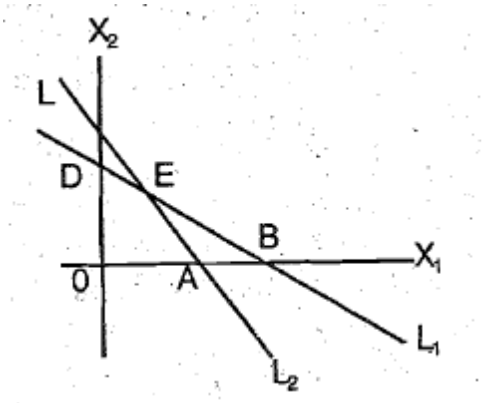
    (b) ±2/3

    (c) ±1/2

    (d) None of these

11. The common region represented by the following in qualities

    $L_1: x_1+x_2< 4$: L_2: $2x_1-x_2>6$



(a) OABC

(b) outside of OAB

(c) Δ BCE

(d) Δ ABE

12. An employer recruits experienced (x) and fresh workmen(y) for his under the condition that he can not employ more than 11 people and y can be related by the inequality.

(a) $x+y \neq 11$

(b) $x+y \leq 11, x \geq 0, y \geq 0$

(c) $x+y \geq 11, x \geq 0, y \geq 0$

(d) none of these

13. $6x + y \geq 18, x + 4y \geq 12, 2x + y \geq 10$ On solving the inequalities; we get:

(a) (0, 18), (12, 0), (4, 2) & (7, 6)

(b) (3, 0), (0, 3), (4, 2) & (7, 6)

(c) (5, 0), (0, 10), (4, 2) & (7, 6)

(d) (0, 18), (12, 0), (4, 2), (0, 0) & (7, 6)

14. Find the effective rate of interest if an amount of 30,000 deposited in a bank. For 1 year at the rate of 10% per annum compounded semi-annually.

(a) 10.05%

(b) 10.10%

(c) 10.20%

(d) 10.25%

15. The present population of a town is 25,000. If it grows at the rate of 4%, 5%, 8% during 1st year, 2nd year, 3rd year respectively. Then find the population after 3 years.

(a) 29,484

(b) 29,844

(c) 29,448

(d) 28,944

16. The present value of a scooter is ₹ 7290. The rate of depreciation is 10%. What was its value 3 years ago?

(a) 10000

(b) 10010

(c) 9990

(d) 12000

17. The rate of interest for the first 2 year is 3% per annum, for next 3 years is 8% per annum and for the period beyond 5 years, 10% per annum. If a man gets ₹ 1520 as a simple interest for 6 years; how much money did he deposit?

(a) ₹ 3800

(b) ₹ 3000

(c) ₹ 4000

(d) None of these

18. Suppose your parent decides to open a PPF account in a bank towards your name with ₹ 10,000 every year staring from today for next 15 years. When you receive and get 8.5% per annum interest rate compounded annually. What is the present value of this annuity?

(a) 83,042

(b) 80,900

(c) 90,100

(d) None of these

19. In what rate % per annum will ₹ 1,000 amounts to ₹ 1331 in 3 years? The interest is compounded yearly is:

(a) 10%

(b) 12%

(c) 11%

(d) None of these

20. The difference between simple interest and compound interest on a certain for 2 years at 10% p.a. is ₹ 10. Find the Sum

(a) ₹ 1010

(b) ₹ 1095

(c) ₹ 1000

(d) ₹ 990

21. The future value of an annuity of ₹ 5,000 is made annually for 8 years at interest rate of 9% compounded annually [Given that (1.09) =1.99256] is

(a) ₹ 55,142.22

(b) ₹ 65,142.22

(c) ₹ 65,532.22

(d) ₹ 57,425.22

22. In how many years will a sum of money becomes four times at 12% p.a. simple interest?

(a) 18 years

(b) 21 years

(c) 25 years

(d) 28 years

23. The effective rate of interest does not depend upon

(a) Amount of Principal

(b) Amount of Interest

(c) Number of Conversion periods

(d) None of these

24. Find the effective rate of interest at 10% p.a. When interest is payable quarterly.

(a) 10.38%

(b) 5%

(c) 5.04%

(d) 4%

25. In simple interest if the principle is ₹ 2,000 and the rate and time are roots of the equation

$x^2-11x+30 = 0$

(a) ₹ 500

(b) ₹ 600

(c) ₹ 700

(d) ₹ 800

26. Determine the present value of perpetuity of ₹ 50,000 per month at the rate interest 12% per annum is

(a) ₹ 45,00,000

(b) ₹ 50,00,000

(c) ₹ 55,00,000

(d) ₹ 60,00,000

27. Find the number of even numbers greater than 100 that can be formed with the digits 0,1,2,3?

(a) 10

(b) 15

(c) 20

(d) None of these

28. In how many ways can the letters of the word "ALEGEBRA" be arranged without changing the relative order of the vowels?

(a) 82

(b) 70

(c) 72

(d) None of these

29. In how many ways can the letters of the word "DIRECTOR" be arranged so that the three vowels are never together?

(a) 180

(b) 18,000

(c) 18,002

(d) None of these

30. The first and fifth term of an A.P. of 40 terms are -29 and -15 respectively. Find the sum of all positive terms of this A.P.

(a) 1605

(b) 1705

(c) 1805

(d) None of these

31. If the common difference of an AP equals to the first term, then the ratio of its m^{th} term and n^{th} term is:

(a) n:m

(b) m: n

(c) $m^2:n^2$

(d) None of these

32. Find the value of 1 + 2 + 3 + ---------- + 105

(a) 5000

(b) 5560

(c) 5565

(d) None of these

33. In a G. P sixth term is 729 and the common ratio is 3, then the first term of G.P is

(a) 2

(b) 3

(c) 4

(d) 7

34. The number ways in which 4 persons can occupy 9 vacant seats is

(a) 6048

(b) 3024

(c) 1512

(d) 4536

35. If A = {1, 2,3}, B = {3,4} and C = {4, 5,6} ,then $A \times (B \cap C)$ =

(a) {(1,4), (2,4), (3,4)}

(b) {(4,4), (4,3), (4,1)}

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

(d) {(1, 2), (1, 4), (1, 6), (3, 4)}

36. Let R be a relation on N defined by x +2y = 8. The domain of R is:

(a) {2, 4, 8}

(b) {2, 4, 6, 8}

(c) {2, 4, 6}

(d) {1, 2, 3, 4}

37. The domain of the function $f(x) = \frac{x^2 + 3x + 5}{x^2 - 5x + 4}$ is:

(a) R

(b) R –{1, 4}

(c) R – {1}

(d) (1, 4)

38. If $y = x^x$, then $\frac{dy}{dx}$ is :

(a) $x^x (2 + \log x)$

(b) $x^x \log(ex)$

(c) $x^x \log\left(\frac{e}{x}\right)$

(d) None of these

39. If $y = \sqrt{x} + \frac{1}{\sqrt{x}}$ then $2x\frac{dy}{dx}$ is

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

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

(c) $x - \frac{1}{x}$

(d) None of these

40. Evaluate $\int 2^x x^2 dx$

(a) $\frac{2^x.x^2}{2} - \frac{x.2^{x+1}}{(\log 2)^2} + \frac{2^{x+1}}{(\log 2)^2} + c$

(b) $\frac{2^x.x^3}{3} - \frac{x^2.2^{x+1}}{(\log 2)^2} + \frac{2^{x+1}}{(\log 3)^2} + c$

(c) $\frac{2^x.x^2}{3} - \frac{x^3.2^x}{3} + \frac{2^{x+1}}{(\log 2)^3} + c$

(d) None of these

41. Find missing term of the series 2, 3,3,5, 10, 13, ? , 43, 172, 177

(a) 23

(b) 38

(c) 39

(d) 40

42. Find wring number of the series 1,5,5,9,7,11,11,15,12,17

(a) 11

(b) 12

(c) 17

(d) 15

43. Find missing term of the letter series A, CD, GHI, UVWXY

(a) LMNO

(b) MNO

(c) MNOP

(d) NOPQ

44. In a certain code TELEPHONE is written as ENOHPELET. How is ALIGATOR written in that code?

(a) ROTAGILA

(b) ROTAGAIL

(c) ROTAGILE

(d) ROTEGILA

45. In a certain Code, 'CLOUD' is written as 'GTRKF'. How is 'SIGHT' written in that code?

(a) UGHHT

(b) UHJFW

(c) WFJGV

(d) WGJHV

46. Raju starts walking straight towards East. After walking 75 metres, he turns to the left and walks 25 metres straight. Again, he turns to the left, walks a distance of 40 metres straight, again he turns to the left and walks a distance of 25 metres. How far is he from the starting point?

(a) 25 meters

(b) 50 meters

(c) 115 meters

(d) 35 meters

47. Ravi started from the house towards West. After walking a distance of 30 metres, he turned towards right and walked 20 metres. He then turned left and moving a distance of 10 metres, turned to his left again and walked 40 metres. He now turned to the left and walked 5 metres. Finally, he turned to his left. In which direction was he walking now?

(a) North

(b) South

(c) East

(d) South-West

48. I am facing South. I turn right and walk 20 meters. Then I turn right again and walk 10 meters. Then I turn left and walk 10 meters and then turning right walk 20 meters. Then I turn right again and walk 60 meters. Which direction am I facing now?

(a) North

(b) North-West

(c) East

(d) North-East

49. Going 50 m to the south of her house Radhika turns left and goes another 20 m. Then turning to the North, she goes 30 m and then starts walking to her house. In which direction is she walking now?

(a) North-West

(b) North

(c) South-East

(d) East

50. A man is facing west. He turns 45^0 in the clockwise direction and then another 180^0 in the same direction and then 270^0 in the anticlockwise direction. Which direction is he facing now?

(a) South

(b) North-West

(c) West

(d) South-West

51. E is the son of A. D is the son of B. E is married to C. C is B's daughter. How is D related to E ?

(a) Brother

(b) Uncle

(c) Brother-in-law

(d) Husband

52. Pointing towards a girl in the photograph, Pooja said. “She is the mother of Janaki whose father is my son.” How is Pooja related to the girl in the photograph?

(a) Mother

(b) Cousin

(c) Aunt

(d) Mother-in-Law

53. Following questions are based on the information given below.

(i) 'P×Q' means 'P is the father of Q'.

(ii) 'P−Q' means 'P is the sister of Q'.

(iii) 'P+Q' means 'P is the mother of Q'.

(iv) 'P÷Q' means 'P is the brother of Q'.

In the expression B+D×M÷N, how M is related to B

(a) Granddaughter

(b) Son

(c) Grandson

(d) Granddaughter or Grandson

54. There are six children playing football namely A, B, C, D, E and F. A and E are brothers. F is the sister of E. C is the only son of A's uncle. B and D are the daughters of the brother of C's father. How is C related to F ?

(a) Cousin

(b) Brother

(c) Son

(d) Uncle

55. Mr. Vimlesh said, “This girl is the wife of the grandson of my mother.” How is the Mr. Vimlesh related to the girl?

(a) Father

(b) Grand Father

(c) Husband

(d) Father–in–Law

56. Six students are sitting in row in an examination hall. K is sitting between V and R. V is sitting next to M. M is sitting next to B. B is sitting extreme left and Q is sitting next to R . Who is sitting adjacent to V?

(a) M and R

(b) M and K

(c) K and R

(d) M and Q

(57-58) Read the following information carefully and answer the questions and answer the questions that follow.

There are 3 females A, B and E and 4 males C, D, F, and G standing in a straight line. No two females are together. B is to right of C, F and D are not together as A is placed between them. G is not near B or E but E and F are together. D is not to the right of B.

57. Who are in the extreme ends?

(a) G and B

(b) C and F

(c) B and D

(d) None of these

58. Who is exactly in the middle?

(a) A

(b) F

(c) E

(d) None of these

Study the following information carefully and answer the given Questions

Seven persons A, B, C, D, E, F and G are sitting in a straight line (not necessarily in the same order) facing North.

I. Only two persons sit between F and G and G sits second to the left of B.

II. D sits third to the left of C

III. E sits exactly between G and B and B sits at the extreme right end of the row.

59. Who amongst the following sits at the extreme left of the line?

(a) F

(b) D

(c) C

(d) E

60. Who amongst the following sits exactly middle of the line?

(a) A

(b) C

(c) E

(d) G

Part B: Statistics

61. Histogram is used for finding:

(a) Mode

(b) Mean

(c) First Quartile

(d) None

62. Data are said to be _____ if the investigator himself is responsible for the collection of data.

(a) Primary Data

(b) Secondary Data

(c) Mixed of Primary and Secondary Data

(d) None of these

63. The frequency of the Class 20-30 in the following data is;

Class	0-10	10-20	20-30	30-40	40-50
Cumulative Frequency	5	13	28	34	38

(a) 5

(b) 28

(c) 15

(d) 13

64. There were 200 employees in an office in which 150 were married. Total male employees were 160 out of which 120 were married. What was the female unmarried employees?

(a) 30

(b) 10

(c) 40

(d) 50

65. The quartile deviation from the following observations is 10,18,20,28,15,17,22,25,29,32,34 is equal to:

(a) 8

(b) 6

(c) 10

(d) 5

66. SD of first five consecutive natural numbers is:

(a) $\sqrt{10}$

(b) $\sqrt{8}$

(c) $\sqrt{3}$

(d) $\sqrt{2}$

67. If the profit of a company remains same for the last 10 months then the SD of profit of the company would be:

(a) Positive

(b) Negative

(c) Zero

(d) either (a) or (c)

68. A batsman in his 20th innings makes a score of 120 and thereby increases his average by 5. What is his average after 20th innings?

(a) 60

(b) 55

(c) 65

(d) 70

69. The sum of squares of the deviations of the given values from their ..... is minimum.

(a) Arithmetic Mean

(b) Median

(c) Mode

(d) None of these

70. When mean is 3.57 and mode is 2.13 then the value of median is

(a) 3.09

(b) 5.01

(c) 4.01

(d) None of these

71. The mean of first three terms is 14 and mean of next two terms is 18. The mean of all five terms is

(a) 14.5

(b) 15

(c) 14

(d) 15.6

72. The Standard deviation of a variable x is to be 10. The Standard deviation of 50+5x is

(a) 50

(b) 100

(c) 10

(d) 500

73. The Quartile deviation is

(a) 2/3 of SD

(b) 4/5 of SD

(c) 5/6 of SD

(d) None of these

74. The first Quartile is 142 and Semi-Inter Quartile Range is 18 , then the value of Median is:

(a) 151

(b) 160

(c) 178

(d) None of these

75. Geometric Mean of 8,4, 2 is

(a) 4

(b) 2

(c) 8

(d) none of these

76. If P(A) = $\frac{1}{2}$; P(B) = $\frac{1}{3}$ and $P(A \cap B) = \frac{1}{4}$ then the value of $P(\overline{A} U \overline{B})$ is:

(a) $\frac{1}{4}$

(b) $\frac{3}{4}$

(c) $\frac{2}{5}$

(d) None of these

77. From the following probability distribution table, find E(x).

x:	1	2	3
f(x):	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{6}$

(a) 1

(b) 1.50

(c) 1.67

(d) None of these

78. A husband and a wife appear in an interview for two vacancies in the same post. The probability of husband's selection is 3/5 and that of wife's selection is 1/5. Then the probability that only one of them is selected is:

(a) 16/25

(b) 17/25

(c) 14/25

(d) None of these

79. A bag contains 5Red and 4 Black balls. A ball is drawn at random from the bag and put into another bag contains 3 red and 7 black balls. A ball is drawn randomly from the second bag. What is the probability that it is red?

(a) 32/99

(b) 1/3

(c) 74/99

(d) None of these

80. If x be a poison variates with parameter 1; then find P(3<X<5). (Given e^{-1}= 0.36783)

(a) 0.015326

(b) 0.15326

(c) 0.012326

(d) None of these

81. The probability that a student is not a swimmer is $\frac{1}{5}$, then the probability that out of five students four are swimmers is:

(a) $\left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)$

(b) ${}^5C_1\left(\frac{1}{5}\right)^4\left(\frac{4}{5}\right)$

(c) ${}^5C_4\left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)$

(d) None of these

82. In a Binomial distribution n = 9 and P = 1/3. What is the value of Variance.

(a) 8

(b) 4

(c) 2

(d) 16

83. The variance of standard normal distribution is

(a) 1

(b) 0

(c) σ^2

(d) 0

84. In a Poisson Distribution P(x=0) =P(x=2). Find E(x)

(a) $\sqrt{2}$

(b) 2

(c) -1

(d) 0

85. Name of the distribution which has Mean= Variance

(a) Binomial

(b) Poisson

(c) Normal

(d) (a) and (b)

86. If the difference between mean and mode is 33, then the difference between Mean and Median will be _____

(a) 63

(b) 31.5

(c) 11

(d) None of the above

87. Relative frequency for a particular class lies between:

(a) 0 and 1

(b) 0 and 1, both inclusive

(c) -1 and 0

(d) -1 and 1

88. Less than type and more than type Ogives meet at a point known as:

(a) Mean

(b) Median

(c) Mode

(d) None

89. If mean and coefficient of variation of the marks of n students is 20 and 80 respectively. What will be variance of them

(a) 256

(b) 16

(c) 25

(d) None of these

90. A non-leap year, the probability of getting 53 Sundays or 53 Tuesdays or 53 Thursdays is

(a) 4/7

(b) 2/7

(c) 3/7

(d) 1/7

91. In a bivariate distribution if the rank correlation coefficient r = 0.12; ΣD^2 =146; Then the no. of observed pairs (N) is

(a) 9

(b) 8

(c) 7

(d) 10.

92. For 10 pairs of observations, number of concurrent deviations was found to be 4. What is the value of the coefficient of concurrent deviation?

(a) $\sqrt{0.2}$

(b) 1/3

(c) -1/3

(d) $-\sqrt{0.2}$

93. Consider the two regression lines 3x + 2y = 26 & 6x + y = 31, Find the mean values of x and y.

(a) $\bar{x} = 4$ and $\bar{y} = 7$

(b) $\bar{x} = 7$ and $\bar{y} = 4$

(c) $\bar{x} = 5$ and $\bar{y} = 6$

(d) None of these

94. For a m×n two way or bivariate frequency table, the maximum number of marginal distributions is coefficient

(a) 1

(b) 2

(c) m+n

(d) mn

95. If the regression line of Y on X is given by Y = X + 2 and Karl Pearson's coefficient of correlation is 0.5 then $\frac{\sigma_y^2}{\sigma_x^2}$ = _____.

(a) 3

(b) 2

(c) 4

(d) None of these

96. The number of tests of Adequacy is

(a) 2

(b) 3

(c) 4

(d) 5

97. Fishers Ideal formula for calculating Index number satisfies the

(a) Unit Test

(b) Factor Reversal Test

(c) Time reversal Test

(d) both (b) and (d)

98. Purchasing power of money is

(a) Reciprocal of Price index number

(b) Equal to Price Index number

(c) Unequal to Price Index number

(d) None of these

99. The simple index number for the current year using simple aggressive method for the following data

Commodity base	Base year Price (P_0)	Current Year Price (P_1)
Wheat	80	100
Rice	100	150
Gram	120	250
Pulses	200	300

(a) 200

(b) 150

(c) 240

(d) 160

100. The cost-of-living index number in year 2015 and 2018 were 97.5 and 115 respectively. The salary of CA Jitendra in 2015 was 195000. How much additional salary was required for him in 2018 to maintain the same standard of living as in 2015?

(a) 30,000

(b) 40,000

(c) 35,000

(d) 45,000