

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. The value of $\frac{64(b^4a^3)^6}{4(a^3b)^2 \times (ab)^2}$
- (a) $16 a^{10}b^{20}$
(b) $4 a^{20}b^{10}$
(c) $8 a^{10}b^{20}$
(d) $4 a^{10}b^{20}$
2. Four persons A, B, C, D wish to share a sum in the ratio of 5:4:2:3. If D gets ₹1000 less than C, then the share of B ?
- (a) 2000
(b) 1200
(c) 2400
(d) 3000
3. The mean proportional between $12x^2$ and $27y^2$
- (a) $18 xy$
(b) $81 xy$
(c) $8xy$
(d) $9xy$
4. If thrice of A's age 6 years ago be subtracted from twice his present age, the result would be equal to his present age. Find A's present age.
- (a) 7
(b) 8
(c) 9
(d) 6
5. If one root of the quadratic equation is $2-\sqrt{3}$ from the equation given that the roots are irrational. Then find the Quadratic equation.
- (a) $x^2-4x+1=0$
(b) $x^2+4x-1=0$
(c) $x^2-4x-1=0$
(d) $x^2+4x+1=0$

6. If $\log_3 4 \cdot \log_4 5 \cdot \log_5 6 \cdot \log_6 7 \cdot \log_7 8 \cdot \log_8 9 = x$, then find the value of x
- (a) 4
 - (b) 2
 - (c) 3
 - (d) 1
7. if $\frac{1}{2} \log_{10} 4 = y$ and if $\frac{1}{2} \log_{10} 9 = x$, then the value of $\log_{10} 15$
- (a) $x-y+1$
 - (b) $x+y-1$
 - (c) $x+y+1$
 - (d) $y-x+1$
8. If the roots of $(k-4)x^2 - 2kx + (k+5) = 0$ are coincident. Then the value of k ?
- (a) 14
 - (b) 20
 - (c) 18
 - (d) 22
9. If $3x+2 < 2x+5$ and $4x-5 \geq 2x-3$, then x can take from the following values
- (a) 3
 - (b) -1
 - (c) 2
 - (d) -3
10. The cost prices of 3 pens and 4 bags is ₹324. and 4 pens and 3 bags is ₹257, then cost price of 1 pen is equal to
- (a) ₹16
 - (b) ₹18
 - (c) ₹50
 - (d) ₹75
11. In a hostel ration stocked for 400 students upto 31 days. After 28 days 280 students were vacated the hostel. Find the number of days for which the remaining ration will be sufficient for the remaining students.
- (a) 5
 - (b) 4
 - (c) 7
 - (d) 10
12. The sum of the two numbers is 8 and the sum of their squares is 34. Taking one number as x form an equation in x and hence find the numbers. The numbers are
- (a) (7,10)
 - (b) (4,4)

- (c) (3,5)
(d) (2,6)
13. ₹80,000 is invested to earn a monthly interest of ₹1200 at the rate of _____ p.a. Simple interest.
(a) 12%
(b) 14%
(c) 16%
(d) 18%
14. Find the present value of an ordinary annuity of 8 quarterly payments of ₹500 each, the rate of interest being 8% p.a. compound quarterly
(a) 4275.00
(b) 4725.00
(c) 3662.50
(d) 3266.50
15. The effective annual rate of interest corresponding to a normal rate of 6% per annum payable half yearly is:
(a) 6.06 %
(b) 6.07 %
(c) 6.08 %
(d) 6.09 %
16. A trust fund has invested ₹ 27000 money in two schemes 'A' and 'B' offering compound interest at the rate of 8% and 9% per annum respectively. If the total amount of interest accrued through these two schemes together in two years was ₹ 4818.30. What was the amount invested in schemes 'A'?
(a) ₹12,000
(b) ₹12,500
(c) ₹13,000
(d) ₹12,500
17. A sum of money invested of compound interest double itself in four years. In how many years it become 32 times of itself at the same rate of compound interest.
(a) 12 years
(b) 16 years
(c) 20 years
(d) 18 years
18. The difference between compound interest and simple interest on an amount of ₹15,000 for 2 years is ₹96. What is the rate of interest per annum?
(a) 9%
(b) 8%

- (c) 11%
- (d) 10%
19. A machine with useful life of 7 years costs ₹ 10,000 while another machine with useful life of 5 years costs ₹8000. The first machine saves labour expenses of ₹ 1900 annually and the second one saves labour expenses of ₹ 2200 annually.
- Determine the preferred course of action. Assume cost of borrowing as 10% compounded per annum.
- (a) 1st Machine should be purchased
- (b) 2nd Machine should be purchased
- (c) Information is not sufficient
- (d) None of these
20. How much amount is required to be invested every year so as to accumulate ₹5,00,000 at the end of 12 years if interest is compounded annually at 10% {Where $A(12,0.1) = 3.1384284$ }
- (a) ₹23381.65
- (b) ₹ 24385.85
- (c) ₹26381.65
- (d) ₹28362.75
21. Raju invests ₹20,000 every year in a deposit scheme starting from today for next 12 years. Assuming that interest rate on this deposit is 7% per annum compounded annually. What will be the future value of this annuity? Given that $(1+0.07)^{12} = 2.25219150$
- (a) ₹ 540,576
- (b) ₹ 382,816
- (c) ₹ 643,483
- (d) ₹ 357,769
22. Mr. A invested ₹ 20,000 every year for next 3 years at the interest rate of 8 percent per annum compounded annually. What is future value of the annuity? $(1.08)^3 = 1.2597$
- (a) 62644
- (b) 62464
- (c) 64925
- (d) 63442
23. ₹10,000 is invested every month and in an account paying interest @ 12% per annum compounded monthly. What is the future value of this annuity just after making 11th payment" (Given that $(1.01)^{11} = 1.1156$)
- (a) ₹115,600
- (b) ₹156100
- (c) ₹156,800
- (d) ₹157,100

24. Sinking fund factor is the reciprocal of :
- (a) Present value interest factor of a single cash flow
 - (b) Present value interest factor of an annuity
 - (c) Future value interest factor of an annuity
 - (d) Future value interest factor of a single cash flow.
25. 10 years ago the earning per share (EPS) of ABC Ltd. was ₹5 share its EPS for this year is ₹22. Compute at what rate, EPS of the company grow annually?
- (a) 15.97%
 - (b) 16.77%
 - (c) 18.64%
 - (d) 14.79%
26. The number of ways of 4 boys and 3 girls are to be seated for a photograph in a row alternatively.
- (a) 24
 - (b) 164
 - (c) 144
 - (d) 336
27. if there are 30 points in a plane of which 5 points are lies on the same line. Then the number of triangles can be formed ?
- (a) 650
 - (b) 580
 - (c) 4050
 - (d) 4060
28. The value n, r If ${}^n P_r = 3024$ and ${}^n C_r = 126$
- (a) 9,4
 - (b) 10, 7
 - (c) 12, 5
 - (d) 11, 6
29. The number of 3-digit odd numbers can be formed using the digits 5,6,7, 8, 9. If repetition is allowed?
- (a) 56
 - (b) 75
 - (c) 95
 - (d) 45
30. If $f(x) = x^2 - 5$, evaluate $f(3)$, $f(-4)$, $f(5)$ and $f(1)$.
- (a) 0, 11, 20, 4
 - (b) -4, 11, -2, 4

- (c) 4, 11, 20, -4
 (d) -2, 0, 20, 5
31. The 5th and 8th terms of a GP series is 27 and 729. Then find the 10th term.
 (a) 729
 (b) 243
 (c) 81683
 (d) 6561
32. In AP $T_p = q$ and $T_q = P$ then $T_{p+q} = \dots\dots\dots$
 (a) 0
 (b) $-(p+q)$
 (c) $\frac{p+q}{2}$
 (d) 1
33. Four Geometric Means between 4 and 972 are
 (a) 12, 30, 100; 324
 (b) 12, 24, 108, 320
 (c) 10, 36, 108, 320
 (d) 12, 36, 108, 324
34. if $A = \{0, 1, 2, 3, 4, 5\}$ then the number of subsets of A is
 (a) 64
 (b) 63
 (c) 61
 (d) 60
35. The number of proper subsets of $A \cap B$, $A = \{1, 2, 3, 4, 5, 7, 8, 9, 10\}$ and $B = \{2, 4, 6, 7, 9\}$
 (a) 8
 (b) 15
 (c) 16
 (d) 64
36. If $y = x(x-1)(x-2)$ then $\frac{dy}{dx}$ is
 (a) $3x^2 - 6x + 2$
 (b) $-6x^2 + 2$
 (c) $3x^2 + 2$
 (d) $3x^3 + 5$

37. If $\int_0^1 (3x^2 + 2x + k)dx = 0$, find k.
- 0
 - 1
 - 2
 - 1
38. If $f(x) = 2x^3 - 15x^2 + 36x + 10$ at which $f(x)$ is minimum and at which $f(x)$ is maximum.
- at $x = 3$ and $x = 2$
 - at $x = 2$ and $x = 3$
 - at $x = -3$ and $x = -2$
 - at $x = 3$ and $x = -2$
39. $\int_0^2 3x^2 dx$ is
- 7
 - 8
 - 8
 - 7
40. $\int (2x+3)^5 dx$ is
- $\frac{(2x-3)^6}{6} + c$
 - $\frac{(2x-3)^6}{2} + c$
 - $\frac{(2x+3)^6}{12} + c$
 - $\frac{(2x-3)^6}{5} + c$
41. If GOODNESS is coded as HNPCODTR, then how GREATNESS can be written in that code?
- HQZSMFRT
 - HQFZUFRTM
 - HQFZUODTR
 - HQFZUMFRT
42. In certain code language, if TOUR, is written as 1234, CLEAR is written 5678 and SPARE is written as 90847, Find the code for TEARS?
- 17847
 - 14847

- (c) 15247
 - (d) 17849
43. If ROSE is coded as 6821, CHAIR is coded as 73456 and PREACH is coded as 961473, what will be the code for RESEARCH?
- (a) 61246173
 - (b) 61214673
 - (c) 61216473
 - (d) 61214743
44. Find the next alphabet series in the given sequence? ALN, DNP, GPR?
- (a) KLN
 - (b) JRT
 - (c) RNU
 - (d) RNV
45. Find the missing number in the following series? 2, 5, 10, 17, 26?
- (a) 49
 - (b) 47
 - (c) 37
 - (d) 36
46. Find the odd man out: 34, 105, 424, 2125, 12755.
- (a) 12755
 - (b) 2125
 - (c) 424
 - (d) 34
47. Ram moves towards South-East a distance of 7 km, then he moves towards West and travels a distance of 14 km. from there he moves towards North–West a distance of 7 km and finally he moves a distance of 4 km towards east. How far is he now from the starting point?
- (a) 3 km
 - (b) 4 km
 - (c) 10 km
 - (d) 11 km
48. P, Q, R and S are playing a game of carom P, R and S, Q are partners, 'S' is to the right of 'R'. If 'R' is facing West, then 'Q' is facing which direction?
- (a) South
 - (b) North
 - (c) East
 - (d) West

49. One morning a boy starts walking in a particular direction for 5 Km and then takes a left turn and walks another 5 Km. thereafter he again takes left turn and walks another 5 Km and at last he takes right turn and walks 5 Km. Now he sees his shadow in front of him. What direction he did start initially?
- (a) South
 - (b) North
 - (c) West
 - (d) East
50. It is 3'o clock in a watch. If the minute hand points towards the North-East then the hour hand will point towards the
- (a) South
 - (b) South – West
 - (c) North– West
 - (d) South – East
51. A man is facing west. He turns 45° in the clockwise direction and then another 180° in the same direction and then 270° in the anticlockwise direction. Find which direction he is facing now?
- (a) South-East
 - (b) West
 - (c) South
 - (d) South-West
52. Six persons A, B, C, D, E and F are sitting in two rows with three persons in each row. Both rows are in front of each other. E is not at the end of the any row and D is second left to the F, C is neighbour of E and diagonally opposite to D. If B is neighbour F who is in front of C then who is sitting diagonally to F?
- (a) C
 - (b) E
 - (c) A
 - (d) D
53. Five students are standing in a circle. Abhinav is between Alok and Ankur. Apurva is on the left of Abhishek. Alok is on the left of Apurva. Who is sitting next to Abhinav on his right?
- (a) Apurva
 - (b) Ankur
 - (c) Abhishek
 - (d) Alok
54. P, Q, R S and T are seated in a line facing west. R is sitting at north end and S is sitting at south end. T is neighbor of R and Q. P and Q are seated together, then who is sitting the middle?
- (a) P
 - (b) Q
 - (c) R

- (d) S
55. Suresh's sister is the wife of Ram, Ram is Rani's brother. Ram's father is Madhur, Sheetal is Ram's grandmother, Rema is sheetal's daughter –in-law. Rohit is Rani's brother's son. Who is Rohit to Suresh?
- (a) Brother-in-law
 - (b) Son
 - (c) Brother
 - (d) Nephew
56. Pointing to a man, a lady said "His mother is the only daughter of my mother". How is the lady related of the man?
- (a) Mother
 - (b) Daughter
 - (c) Sister
 - (d) Aunt
57. In a joint family, there are father, mother, 3 married sons and one unmarried daughter. Out of the sons, two have 2 daughters each and one has a son only. How many female members are there in the family?
- (a) 3
 - (b) 6
 - (c) 9
 - (d) 8
58. When Rani saw Vinit, she recollected that "He is the brother of my grandfather's son". How is Rani related to Vinit?
- (a) Aunt
 - (b) Daughter
 - (c) Sister
 - (d) Niece
59. Annanya is mother of Satya and Shyam is the son of Bhima, Shiva is brother of Annanya. If Satya is sister of Shyam, How Bhima is related to Shiva?
- (a) Son
 - (b) Cousin
 - (c) Brother-in-law
 - (d) Son-in-law
60. Suman is daughter-in-law of Rakesh and sister-in-law of Rajesh, Ramesh is the son of Rakesh and only brother of Rajesh. Find the relation of Suman with Ramesh.
- (a) Sister-in-law
 - (b) Cousin
 - (c) Aunt
 - (d) Wife

Part B: Statistics

61. The most accurate mode of data presentation is :
- (a) Diagrammatic
 - (b) Tabulation
 - (c) Textual presentation
 - (d) None of these.
62. Which is the left part of the table providing the description of the rows?
- (a) Captain
 - (b) Box head
 - (c) Stub
 - (d) Body
63. The mean of 100 observations is 50. If one of the observations which was 50 is replaced by 40, the resulting mean will be:
- (a) 40
 - (b) 49.90
 - (c) 50
 - (d) none of these
64. Ogive for more than type and less than type distributions intersect at
- (a) Means
 - (b) Median
 - (c) Mode
 - (d) Origin
65. If mean (\bar{x}) is = 10 and mode (Z) is = 7, then find out the value of median (M)
- (a) 9
 - (b) 17
 - (c) 3
 - (d) 4.33
66. If the coefficient of variation and standard deviation are 60 and 12 respectively, then the arithmetic mean of the distribution is
- (a) 40
 - (b) 36
 - (c) 20
 - (d) 19

67. _____ is based on all the observations and _____ is based on the central fifty percent of the observations.
- (a) Mean deviation, Range
 - (b) Mean deviation, quartile deviation
 - (c) Range, standard deviation
 - (d) Quartile deviation, standard deviation
68. The relationship between two variable x and y is given by $4x - 10y = 20$. If the median value of the variable x is 20 then what is median value of variable y ?
- (a) 1.0
 - (b) 2.0
 - (c) 3.0
 - (d) 6.0
69. Which one of the following is not a method of measures of dispersion?
- (a) Standard deviation
 - (b) Mean deviation
 - (c) Range
 - (d) Concurrent deviation method
70. Mode is:
- (a) Least frequent value
 - (b) Middle Most Value
 - (c) Most frequent Value
 - (d) None of these
71. The median of the observations 42, 72, 35, 92, 67, 85, 72, 81, 51, 56 is
- (a) 69.5
 - (b) 72
 - (c) 64
 - (d) 61.5
72. If the sum of square of the value equals to 3390, Number of observation are 30 and Standard deviation is 7, what is the mean value of the above observation?
- (a) 14
 - (b) 11
 - (c) 8
 - (d) 5

73. The mean annual salary of all employees in a company is ₹25,000. The mean salary of male and female employees is ₹27,000 and ₹17,000 respectively. Find the percentage of males and females employed by the company.
- (a) 60% and 40%
 - (b) 70% and 25%
 - (c) 70% and 30%
 - (d) 80% and 20%
74. If the variance of random variable 'x' is 18, then what is variance of $y=2x+5$?
- (a) 34
 - (b) 39
 - (c) 68
 - (d) 72
75. If the variance of given data is 12, and their mean value is 40, what is coefficient of variation (CV)?
- (a) 5.66%
 - (b) 6.66%
 - (c) 7.50%
 - (d) 8.65%
76. In a given set if all data are of same value then variance would be:
- (a) 0
 - (b) 1
 - (c) -1
 - (d) 0.5
77. If Arithmetic mean between two numbers is 5 and Geometric mean is 4 then what is the value of Harmonic mean?
- (a) 3.2
 - (b) 3.4
 - (c) 3.5
 - (d) 3.6
78. The average age of 15 students in a class is 9 years. Out of them, the average age of 5 students is 13 years and that 8 students is 5 years. What is the average of remaining 2 students?
- (a) 5 years
 - (b) 9 years
 - (c) 10 years
 - (d) 15 years

79. Ticket numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn bears a number which is multiple of 3 or 7?
- (a) $1/5$
 - (b) $2/5$
 - (c) $3/5$
 - (d) None of these
80. The probability that is leap year has 53 Sunday is:
- (a) $1/7$
 - (b) $2/3$
 - (c) $2/7$
 - (d) $3/5$
81. If three coins are tossed simultaneously, what is the probability of getting two heads together?
- (a) $1/4$
 - (b) $1/8$
 - (c) $5/8$
 - (d) $3/8$
82. A class consists of 10 boys and 20 girls of which half the boys and half the girls have blue eyes. Find the probability that a student chosen random is a boy and has blue eyes.
- (a) $1/6$
 - (b) $3/5$
 - (c) $1/2$
 - (d) None of these
83. A machine is made of two parts A and B. The manufacturing process of each part is such that probability of defective in part A is 0.08 and that B is 0.05. What is the probability that the assembled part will not have any defect?
- (a) 0.934
 - (b) 0.864
 - (c) 0.85
 - (d) 0.874
84. If $P(A)=1/3$, $P(B)=3/4$ and $P(A \cap B) = 1/6$ then $P(A/B)$ is:
- (a) $1/6$
 - (b) $2/9$
 - (c) $1/2$
 - (d) $1/8$

85. If a number is selected at random from the first 50 natural numbers, what will be the probability that the selected number is a multiple of 3 and 4?
- (a) $5/50$
 - (b) $2/25$
 - (c) $3/50$
 - (d) $4/25$
86. If the first quartile is 56 and the third quartile is 77, then the coefficient of quartile deviation is
- (a) 18.09
 - (b) 15.79
 - (c) 63.80
 - (d) 56.71
87. Skewness of Normal Distribution is –
- (a) Negative
 - (b) Positive
 - (c) Zero
 - (d) Undefined
88. If Poisson distribution is such that $P(X = 2) = P(X = 3)$ then the Standard Deviation of the distribution is
- (a) $\sqrt{3}$
 - (b) 3
 - (c) 6
 - (d) 9
89. The Standard Deviation of Binomial distribution is:
- (a) npq
 - (b) \sqrt{npq}
 - (c) np
 - (d) \sqrt{np}
90. The speeds of bikes follow a normal distribution model with a mean of 80 km/hr and a standard deviation of 9.4 km. /hr. Find the probability that a bike picked at random is travelling at more than 95 km/hr.? [P(z) = P(1.60)=0.4452]
- (a) 0.0548
 - (b) 0.38
 - (c) 0.49
 - (d) 0.278
91. The equations of the two lines of regression are $4x + 3y + 7 = 0$ and $3x + 4y + 8 = 0$. Find the correlation coefficient between x and y.
- (a) -0.75

- (b) 0.25
- (c) -0.92
- (d) 1.25

92. The regression equation are $2x + 3y + 1 = 0$ and $5x + 6y + 1 = 0$, then Mean of x and y respectively are

- (a) -1,-1
- (b) -1,1
- (c) 1, -1
- (d) 2,3

93. If $b_{yx} = 0.5$, $b_{xy} = 0.45$ then the value of correlation coefficient is:

- (a) 0.23
- (b) 0.25
- (c) 0.39
- (d) 0.47

94. Find the coefficient of rank correlation between the marks of following 6 students in two subjects Mathematics and Statistics is:

Mathematics	3	5	8	4	7	10
Statistics	6	4	9	8	1	2

- (a) - 0.26
- (b) 0.35
- (c) 0.38
- (d) 0.20

95. If Y is dependent variable and X is independent variable and the S.D. of X and Y are 5 and 8 respectively and Co-efficient of co-relation between X and Y is 0.8. Find the Regression coefficient of Y on X :

- (a) 0.78
- (b) 1.28
- (c) 6.8
- (d) 0.32

96. Fisher's index number is called as ideal index number because it satisfies.

- (a) Factor reversal test
- (b) Time reversal test
- (c) Both factor and time reversal test
- (d) Circular test

97. From the following data constructed the index number by Laspeyre's method

$$\sum P_1 Q_1 = 100, \sum P_0 Q_1 = 86, \sum P_0 Q_0 = 83, \sum P_1 Q_0 = 106$$

- (a) 130.36

- (b) 131.51
 - (c) 130.59
 - (d) 127.71
98. Which index measures the change from month to month in the cost of a representative basket of goods and services of the type bought by a typical household?
- (a) Retail Price Index
 - (b) Laspeyre's Index
 - (c) Fisher's index
 - (d) Paasche's Index
99. If Fisher's index = 150 and Paasche's Index = 144, then Laspeyre's index is _____
- (a) 147
 - (b) 156.25
 - (c) 104.17
 - (d) 138
100. In price index, when a new commodity is required to be added, which of the following index is used?
- (a) Shifted price index
 - (b) Splicing price index
 - (c) Deflating price index
 - (d) Value price index