Test Series: October, 2020

MOCK TEST PAPER

FOUNDATION COURSE

PAPER 3: BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS

Time: 120 Minutes **Maximum Marks: 100**

Section A: Business Mathematics and Logical Reasoning

1. If x: y = 2: 3, then find (5x+2y): (3x-y)
   (a) 13/3
   (b) 16/3
   (c) 19/3
   (d) 7/3
2. A bag contains ₹187 in the form 1 rupee, 50 paise and 10 paise coins in the ratio 3:4:5. Find the number of each type of coins.
   (a) 102, 136, 170
   (b) 136,102, 170
   (c) 170, 102, 136
   (d) none
3. $\log_e x + \log(1+x) = 0$ is equivalent to
   (a) $x^2+x+e = 0$
   (b) $x^2+x- e = 0$
   (c) $x^2+x+1 = 0$
   (d) $x^2+x-1 = 0$
4. The ratio of the speed of the two trains is 2: 5. If the distances they travel are in the ratio 5: 9, find the ratio of times taken by them.
   (a) 2: 9
   (b) 18: 25
   (c) 25: 18
   (d) 10: 45
5. If $x = 3^{1/4} + 3^{-1/4}$ and $y = 3^{1/4} - 3^{-1/4}$, then the value of $3\left(x^2 + y^2\right)^2$ will be
   (a) 12
   (b) 18
   (c) 46
   (d) 64

6. Find the value of (x + y) , if $\left(x+\frac{y^3}{x^2}\right)^{-1}-\left(\frac{x^2}{y}+\frac{y^2}{x}\right)^{-1}+\left(\frac{x^3}{y^2}+y\right)^{-1}=\frac{1}{3}$

   (a) 1/3

   (b) 3

   (c) ½

   (d) 2

7. If 2x -3y = 1 and 5x +2y = 50, then what is the value of (x-2y)?

   (a) -2

   (b) 6

   (c) 7

   (d) 10

8. The cost of 5 mangoes is equal to the cost of 20 oranges. If the total cost 2 mangoes and 10 oranges is ₹ 22.50, find the cost of two oranges.

   (a) ₹ 1.25

   (b) ₹ 2.50

   (c) ₹ 3

   (d) ₹ 3.50

9. The roots of the quadratic equation $9x^2+ 3kx + 4 = 0$ are equal if

   (a) $k = \pm 2$

   (b) $k = \pm 3$

   (c) $k = \pm 4$

   (d) $k = \pm 5$

10. If one root of a equation is $2+\sqrt{5}$, then the quadratic equation is

    (a) $x^2+ 4x- 1 = 0$

    (b) $x^2- 4x- 1 = 0$

    (c) $x^2 + 4x + 1 = 0$

    (d) $x^2 -4x + 1 = 0$

11. A man sells 6 radios and 4 televisions for ₹ 18,480. If 14 radios and 2 televisions are sold for the same amount. What is the price of radio?

    (a) ₹ 1848

    (b) ₹ 840

    (c) ₹ 1680

    (d) ₹ 3360

12. if $\begin{pmatrix} x+y & 1 \\ 1 & x-y \end{pmatrix} + \begin{pmatrix} 2 & 3 \\ 2 & -4 \end{pmatrix} = \begin{pmatrix} 12 & 4 \\ 3 & 0 \end{pmatrix}$ then

(a) x = 7, y = -3

(b) x = -7, y = -3

(c) x =- 7, y = 3

(d) x = 7, y = 3

13. What is the value of x, if A = $\begin{pmatrix} 1 & 4 \\ 2 & x \end{pmatrix}$ is a singular matrix

(a) 5

(b) 6

(c) 7

(d) 8

14. The transpose of a square matrix is a ___

(a) null matrix

(b) row matrix

(c) Square matrix

(d) Column matrix

15. The solution set of the equations x+2 > 0 and 2x -6 > 0 is

(a) (-2, ∞)

(b) (3, ∞)

(c) (-∞ , -2)

(d) (-∞ , -3)

16. The solution space of the inequalities 2x +y ≤10 and x-y ≤5 :

(i) includes origin

(ii) includes the point (4,3)

Which one is correct?

(a) Only (i)

(b) only (ii)

(c) Both (I) and (ii)

(d) None of these

17. A sum of money triples itself in 18 years under simple interest. what is the rate of interest per annum?

(a) 9 %

(b) 9.09 %

(c) 11.11 %

(d) 13%

18. What time will be required for a sum of money to double itself at 8 % Simple interest?

    (a) 8 Years

    (b) 8.5 Years

    (c) 12.5 Years

    (d) 12 Years

19. The difference between simple interest and compound interest on a sum of ₹ 6,00,000 for two years is ₹ 6000. What is the annual rate of interest?

    (a) 8 %

    (b) 10 %

    (c) 6 %

    (d) 12 %

20. What is the sum of money will amount to ₹ 11035.50 in four years at compound interest for 1^{st} , 2^{nd} , 3^{rd} and 4^{th} years being 4% , 3% , 2% and 1% respectively.

    (a) ₹ 10,000

    (b) ₹ 11,000

    (c) ₹ 1035

    (d) ₹ 11,305

21. Find the present value of ₹ 10,000 to be required after 5 years, if the interest rate be 9 per cent compounded annually (Given: $(1.09)^{-5} = 0.65$)

    (a) ₹ 5500

    (b) ₹ 5600

    (c) ₹ 6000

    (d) ₹ 6500

22. A Machine was purchased for ₹ 10,000. Its rate of depreciation is 10% in the first year and 5 % per annum afterwards. Find the depreciated value of Machine after 7 years of purchase (Given $(0.95)^6 = 0.7351$)

    (a) ₹ 6606

    (b) ₹ 6616

    (c) ₹ 6660

    (d) ₹ 6661

23. A company is considering proposal of purchasing a machine either by making full payment of ₹4,000 or by leasing it for 4 years at an annual rent of ₹1250. Which course of action is preferable? if the company can borrow money at 14 % per annum? [Given: $(1.14)^4 = 1.6870$]

    (a) Leasing preferable

    (b) Leasing is not preferable

    (c) can't say

    (d) none of these

24. A man borrows ₹4000 from a bank at 10% compound interest. At the end of every year ₹ 1,500 as part of repayment of loan and interest. How much is still owe to the bank after three such instalments [Given: $(1.1)^3 = 1.331$]

    (a) ₹ 359

    (b) ₹ 820

    (c) ₹ 724

    (d) ₹ 720.

25. The effective rate of interest for one-year deposit corresponding to a nominal 7 % rate of interest per annum convertible quarterly. is

    (a) 7 %

    (b) 7.5

    (c) 7.4 %

    (d) 7.18 %

26. The future value of annuity of ₹1,000, made annually for 5 years at the interest of 14% compounded annually is (Given $(1.14)^5 = 1.925410$)

    (a) ₹ 5610

    (b) ₹ 6610

    (c) ₹ 6160

    (d) ₹ 6160

27. What will be the population after three years when present population is ₹25,000 and population increases at the rate of 3 % in first year, 4 % in second year and 5 % in third year?

    (a) 28119

    (b) 29118

    (c) 27000

    (d) 30000

28. SI = 0.125 P at 10% p.a find the time

    (a) 1.25 years

    (b) 25 Years

    (c) 0.25 Years

    (d) none

29. The number of triangles that can be formed by choosing the vertices from set of 12 points, seven of which lie on the same straight line is

    (a) 185

    (b) 175

    (c) 115

    (d) 105

30. How many ways can be letters of the word “FAILURE’ be arranged so that the consonants may occupy only odd places?

    (a) 576

    (b) 476

    (c) 376

    (d) 276

31. In an examination a candidate has to pass in each of the 4 papers. In how many different ways can be failed?

    (a) 14

    (b) 16

    (c) 15

    (d) None of these

32. In an election the number of candidates is one more than the number of members to be elected. If a voter can vote in 254 different ways; find the number of candidates.

    (a) 8

    (b) 10

    (c) 7

    (d) None of these

33. If a, b, c are in AP and x, y, z are in GP , then the value of $x^{(b-c)} .y^{(c-a)} .z^{(a-b)}$ is

    (a) 1

    (b) 0

    (c) b (c-a)

    (d) none

34. The sum of the first two terms of an infinite geometric series is 15 and each term is equal to the sum of all the terms following it; then the sum of the series is

    (a) 20

    (b) 15

    (c) 25

    (d) None of these

35. Let f: R$\rightarrow$R be such that $f(x) = 2^x$, then f(x+y) equals

    (a) f(x) + f(y)

    (b) f(x). f(y)

    (c) f(x) ÷f(y)

    (d) none of these

36. If A = { p, q, r, s } , B = { q, s , t} and C= { m , q, n} find C-(A$\cap$B)

    (a) {m, n}

    (b) {p, q}

(c) {r, s}

(d) {p, r}

37. The set having no element is called

(a) Singleton set

(b) null set

(c) finite set

(d) Infinite set

38. If $x\sqrt{1+y}+y\sqrt{1+x}=0, then\ (1+x)^2\frac{dy}{dx}=$

(a) 0

(b) 1

(c) -1

(d) 2

39. Find $\frac{dy}{dx}$ at $t=1$ when $x=t\log t$ and $y=\frac{(\log t)}{t}$

(a) 1

(b) -1

(c) -1/2

(d) 0

40. If $f'(x) = 3x^2+2$ and $f(0) = 0$, find $f(2)$

(a) 5

(b) 8

(c) 10

(d) 12

41. Find next number in the following series 7, 11, 13, 17, 19, 23, 25, 29?

(a) 30

(b) 31

(c) 32

(d) 33

42. Find odd man out of the following series 41, 43, 47, 53, 61, 71, 73, 81

(a) 41

(b) 47

(c) 61

(d) 81

43. If PLAY is coded as 8123 and RHYME is coded as 49367. What will be code of MALE?

(a) 6217

(b) 6198

(c) 6395

(d) 6285

44. Find the alphabet missing series ac_cab_baca_a_ab

(a) aabc

(b) aacb

(c) babb

(d) bcbb

45. If East is replaced by South-East, then West will be replaced by which replaced by which of the following directions?

(a) North-East

(b) North

(c) East

(d) North- West

46. Raju is facing East, he turns 100^0 in the clockwise direction and 145^0in the anti-clock wise direction. Which direction is he facing now?

(a) West

(b) North-East

(c) North

(d) South-West

47. If a man on motor bike starts from a point and rides 4 km South then turns left and rides 2 km and turn again to the right to ride in which direction is he moving?

(a) North

(b) West

(c) South

(d) North

48. Five people A, B, C, D and E are seated about a round table. Every chair is spaced equidistant from adjacent chairs.

I. C is seated next to A

II. A is seated two seats from D.

III. B is not seated next to A.

Which of the following must be true?

(I) D is seated next to B.

II E is seated next to A.

Select the correct answer from the codes given below:

(a) Only I

(b) Only II

(c) Both I and II

(d) Neither I nor II

49. Six friends A, B, C, D, E and F are sitting in a row facing East. 'C' is between 'A 'and 'E'. 'B' is just to the right of É' but left of 'D'. 'F' is not the right end . How many persons are Left of 'E' ?

(a) 1

(b) 2

(c) 3

(d) 4

50. In a straight line there are six persons sitting in a row? B is between F and D. E is between A and C. A does not stand next to F or D, C does not stand next to D. F is between which of the following?

(a) B and E

(b) B and C

(c) B and D

(d) B and A

51. Hema walks 30 km North. Then, she turns right and walks 30 m then she turns right and walks 55 m. Then she turns left and walks 20 m. Then she again turns left and walks 25 m. How many meters away is she from her original position.

(a) 45 m

(b) 50 m

(c) 66 m

(d) 55 m

52. Directions to solve

(a) P, Q, R, S, T, U, V and W are sitting round the circle and are facing the Centre

(b) P is second to the right of T who is the neighbor of R and V.

(c) S is not neighbour of P

(d) V is neighbour of U

(e) Q is not between S and W, W is not between U and S

Who is two of the following are not neighbour

(a) RV

(b) UV

(c) RP

(d) QW

53. Pointing to a photograph of a boy, Ravi said, “He is son of the only son of my mother”. How is Ravi related to that boy ?

(a) Brother

(b) Uncle

(c) Cousin

(d) Father

54. If A +B means A is brother of B, A-B means A is sister of B, and A × B means A is the father of B . Which of the following means that C is the son of M?

(a) M-N×C+F

(b) F-C+ N×M

(c) N+M-F×C

(d) M×N-C+F

55. If D is brother of B and B is related C. To answer this question which of the following statements are necessary?

I. The son of D is the grandson of C.

II. B is the sister of D.

(a) Only 1

(b) Only II

(c) Either I or II

(d) I and II

56. There are two couple in a family. K has two children. M is wife of O, who is the brother of B. F is daughter K. U is sister of S, who is son of O. T is the son of B, who is the male. How U is related to T?

(a) Mother

(b) Brother

(c) Sister

(d) Cousin

57. Statements I: Seetha is a girl.

II: All girls are nice.

Conclusions I: All girls are Seetha.

II: Seetha is not a nice girl.

(a) If only I follow.

(b) If only II follow.

(c) If both I and II follow.

(d) If neither I nor II follow.

58. Statements: I: Some fruits are flowers.

II: No flower is a boat.

III: All boats are rivers.

Conclusions: I: Some fruits are rivers.

II: Some rivers are boats.

III: Some rivers are fruits

IV: Some flowers are fruits

(a) Only I and III follows.

(b) Only II and III follows.

(c) Only II and IV follows

(d) All follows.

59. Statement I : Some chairs are caps . II: No cap is red.

Conclusion: I : Some caps are Chairs

II : No Chair is red

(a) If only Conclusion I follow

(b) If only conclusion II follow

(c) If either I or II follow.

(d) If neither I nor II follow.

60. Statement I: Some tigers are bats

II: Some bats are cats

Conclusion: I: Some tigers are cats

II: Some cats are tigers

(a) If only Conclusion I follow

(b) If only conclusion II follow

(c) If either I or II follow.

(d) If neither I nor II follow.

Section B: Statistics

61. The following data relates to the incomes of 90 persons:

Income in ₹	1500-1999	2000-2499	2500-2999	3000-3499
No.of Persons	13	32	20	25

Which is the percentage of persons earning more than ₹ 2,000?

(a) 45

(b) 85.56

(c) 52

(d) 55

62. The most appropriate diagram to represent the data relating to the monthly expenditure on different items by a family is ?

(a) Histogram

(b) Pie-diagram

(c) Frequency polygon

(d) Line graph

63. The distribution of income is an example of frequency distribution of

(a) Continuous variable

(b) A discrete variable

(c) An attribute

(d) (b) or (c)

64. The number of accidents for seven days in a locality are given below :

No. of accidents	:	0	1	2	3	4	5	6
Frequency	:	12	15	23	30	9	3	2

What is the number of cases when 3 or less accidents occurred?

(a) 56

(b) 6

(c) 80

(d) 87

65. Two variables assume the values 1,2, 3,.. 5 with frequencies as 1, 2, 3, ..5 , then what is the AM ?

(a) 11/3

(b) 15/8

(c) 4.86

(d) 10

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

(a) 70

(b) 72.25

(c) 78

(d) 76

67. Quartile can be determined graphically using

(a) ogive

(b) Histogram

(c) Pie Chart

(d) Frequency Polygon

68. The mean deviation about Mode for the numbers 4/11, 6/11, 8/11, 9/11, 12/11, 8/11 is

(a) 9/15

(b) 12

(c) 6/11

(d) 1/6

69. The range of 28, 22, 40, 20, 15, 50 is
    (a) 40
    (b) 22
    (c) 35
    (d) none of these
70. A shift of origin has no impact on
    (a) Mean Deviation
    (b) Standard Deviation
    (c) Quartile Deviation
    (d) All of these
71. What is the coefficient of variation of the following numbers 53, 52, 61, 60, 64
    (a) 18.09
    (b) 8.09
    (c) 12.23
    (d) 15.45
72. The quartiles of the variables are 45, 52, and 65 respectively, its Quartile Deviation is
    (a) 5
    (b) 10.
    (c) 25
    (d) 8.30
73. The mean and SD for a, b, and 2 are 3 and 1 respectively, the value of ab would be
    (a) 3
    (b) 5
    (c) 12
    (d) 13
74. If the relation between x and y is 5y -3x = 10 and the mean deviation about mean for x is 12, then the mean deviation of y about mean is
    (a) 9.20
    (b) 6.80
    (c) 7.20
    (d) 15.80
75. Which measure of dispersion is based on all the observations
    (a) Standard Deviation
    (b) Mean Deviation
    (c) Quartile Deviation
    (d) Both (a) and (b)

76. An investment consultant predicts that the odds against the price of a certain stock going up are 2:1 and odd are in favor of the price remaining the same are 1:3 .what is the probability that the price of stock will go down ?

    (a) 5/12

    (b) 7/12

    (c) 1/3

    (d) ¼

77. A pair of dice rolled. If the sum of the two dice is 9, find the probability that one of the dice showed is 3

    (a) 1/3

    (b) ¼

    (c) ½

    (d) 1/8

78. The overall percentage of failures in a certain examination was 30. What is the probability that out of a group f 6 candidates at least four passed the examination?

    (a) 0.747331

    (b) 0.757331

    (c) 0.76991

    (d) 0.72339

79. What is the probability of getting neither total of 7 nor 11 when the pair of dice is tossed?

    (a) 7/9

    (b) 2/9

    (c) 3/9

    (d) 4/9

80. What is the probability that a leap year selected at random contains either 53 Sundays or 53 Mondays

    (a) 2/7

    (b) 3/7

    (c) 4/7

    (d) 1/7

81. if A and B are two events, such that P(A) = ¼, P(B) = 1/3 and P(AUB)=1/2, then P(B/A) is equal to

    (a) ¾

    (b) ½

    (c) ¼

    (d) 1/3

82. What is the probability of getting exactly 2 head in 7 tosses of a fair coin?

    (a) 5/64

    (b) 7/64

    (c) 7/128

(d) 21/128

83. The Binomial Distribution for which mean = 15 and variance = 6.0 is

(a) ${}^{25}C_x (3/5)^x (2/5)^{25-x}$

(b) ${}^{25}C_x (2/5)^x (3/5)^{25-x}$

(c) ${}^{25\,C}{}_x (2/5)^x (3/5)^{1-x}$

(d) ${}^{25}C_x (3/5)^x (2/5)^{1-x}$

84. The SD of a binomial distribution with parameter n and p is

(a) n (1– p).

(b) np (1 – p).

(c) np.

(d) $\sqrt{np(1-p)}$.

85. If P(X=2) = P(X=3) for a Poisson Variate X, then E(x) is

(a) 2

(b) 3

(c) 1

(d) none of these

86. The total area of the normal curve is

(a) One.

(b) 50 per cent.

(c) 0.50.

(d) Any value between 0 and 1

87. The mean and mode of the normal distribution

(a) may be equal

(b) may be different

(c) are always equal

(d) (a) or (b)

88. Bivariate Data are the data collected for

(a) Two variables.

(b) More than two variables.

(c) Two variables at the same point of time.

(d) Two variables at different points of time.

89. The two lines of regression become identical when

(a) r = 1

(b) r = –1

(c) r = 0

(d) (a) or (b)

90. The regression coefficients remain unchanged due to a

(a) Shift of origin

(b) Shift of scale

(c) Both (a) and (b)

(d) (a) or (b).

91. If the coefficient of correlation between two variables is –0 .9, then the coefficient of determination is

(a) 0.9

(b) 0.81

(c) 0.1

(d) 0.19

92. When r = 0 then cov (x,y) is equal to

(a) + 1

(b) – 1

(c) 0

(d) none

93. 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.

94. Factor Reversal test is satisfied by

(a) Fisher's Ideal Index Number

(b) Laspeyre's Index Number

(c) Paasche's Index Number

(d) All of the above

95. During the certain period the C.L.I. goes up from 110 to 200 and the Salary of a worker is also raised from 330 to 500, then the real terms is

(a) Loss by ₹ 50

(b) Loss by ₹ 75

(c) Loss by ₹ 90

(d) None of these.

96. The number of tests adequacy is

(a) 2

(b) 5

(c) 3

(d) 4

97. In year 2005, the whole sale price index number is 286 with 1985 as base year, then how much the prices have increased in 2005 in comparison to 1995 ?

(a) 286%

(b) 386%

(c) 86%

(d) 186%

98. When the sale of cold drink increase in summer and decreases in winters is an example of ?

(a) Seasonal Variations

(b) Cyclic Variations

(c) Secular trend

(d) None

99. Seasonal Variations take place within

(a) One year

(b) Two year

(c) half Year

(d) five years

100. The fire in a factory is an example.

(a) Secular trend

(b) Seasonal Variations

(c) Irregular variations

(d) Cyclical Variations