Test Series: March, 2019

FOUNDATION COURSE

MOCK TEST PAPER

PAPER – 3: BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS

Time Allowed 2 Hours **Maximum Marks: 100**

QUESTIONS

PART A: BUSINESS MATHEMATICS AND LOGICAL REASONING

1. The ratio compounded of 2:3, 9:4, 5:6 and 8: 10 is
   (a) 1: 1
   (b) 1:5
   (c) 3: 8
   (d) none of these
2. The sub-triplicate ratio of 8: 27
   (a) 27: 8
   (b) 24: 81
   (c) 2: 3
   (d) none of these
3. If $\frac{p}{q}=\frac{r}{s}=\frac{p-r}{q-s}$, the process is called
   (a) Subtrahendo
   (b) Componendo
   (c) Alternendo
   (d) none of these
4. The value of $\left(\frac{x^a}{x^b}\right)^{\left(a^2+ab+b^2\right)}\times\left(\frac{x^b}{x^c}\right)^{\left(b^2+bc+c^2\right)}\times\left(\frac{x^c}{x^a}\right)^{\left(c^2+ca+a^2\right)}$
   (a) 1
   (b) 0
   (c) -1
   (d) none of these
5. If a = $\log_{12}24$, b = $\log_{36}24$, b = $\log_{48}36$ then prove that 1 + abc =
   (a) 2bc
   (b) 2ca
   (c) 2ba
   (d) 3bc
6. If $x = 5^{1/3} + 5^{-1/3}$, $5x^3-15x$ is given by
   (a) 25

(b) 26

(c) 27

(d) 30

7. Ten years ago the age of a father was four times his son. Ten years hence the age of the father will be twice that of his son. The present age of the father and the son are

(a) (50, 20)

(b) (60, 20)

(c) (55, 25)

(d) none of these

8. When two roots of quadratic equations are α and $\frac{1}{\alpha}$ then what will be quadratic equation.

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

(b) $\alpha x^2- \alpha^2 x + \alpha = 0$

(c) $\alpha x^2-(\alpha^2+1) x + \alpha = 0$

(d) none of these

(9) Let α and β be the roots of equation $x^2+7x + 12 = 0$. Then the value of $\left(\frac{\alpha^2}{\beta}+\frac{\beta^2}{\alpha}\right)$ will be

(a) $\left(\frac{49}{144}+\frac{144}{49}\right)$

(b) $\left(\frac{7}{12}+\frac{12}{7}\right)$

(c) $\left(-\frac{91}{12}\right)$

(d) none of these

10. If $A = \begin{pmatrix} 5 & -2 \\ -1 & 3 \end{pmatrix}$, then Adjoint of Matrix A

(a) $\begin{pmatrix} 3 & -2 \\ -1 & 5 \end{pmatrix}$

(b) $\begin{pmatrix} 5 & 2 \\ -1 & 3 \end{pmatrix}$

(c) $\begin{pmatrix} 3 & -2 \\ 1 & 5 \end{pmatrix}$

(d) $\begin{pmatrix} 3 & 2 \\ 1 & 5 \end{pmatrix}$

11. If $A = \begin{pmatrix} 5 & x \\ y & 0 \end{pmatrix}$ and $A = A^T$, then

    (a) x = 0, y = 5

    (b) x = y

    (c) x + y = 5

    (d) none of these

12. If $A = \begin{pmatrix} 2i & 3i \\ 2i & i \end{pmatrix}$ (here $i^2 = -1$) then $|A| =$

    (a) 2

    (b) 8

    (c) 4

    (d) 5

13. On solving the inequalities $5x + y \leq 100$, $x + y \leq 60$, $x \geq 0$ and $y \geq 0$, we get the following situation.

    (a) (0, 0), (20, 0), (10, 50) and (0,60)

    (b) (0, 0), (60, 0), (10, 50) and (0,60)

    (c) (0, 0), (20, 0), (0, 100) and (10,50)

    (d) none of these

14. A certain money doubles itself in 10 years when deposited on simple interest. It would triple itself in

    (a) 30 years

    (b) 20 years

    (c) 25 years

    (d) 15 years

15. A man deposited Rs. 8, 000 in a bank for 3 years at 5% per annum compound interest, after 3 years he will get

    (a) Rs. 9,000

    (b) Rs.8, 800

    (c) Rs. 9,200

    (d) Rs. 9261

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

    (a) Rs. 240

    (b) Rs. 200

    (c) Rs.220

    (d) Rs.210

17. The value of furniture depreciates by 10% a year, if the present value of the furniture in an office is Rs. 21870, calculate the value of furniture 3 years ago.

    (a) Rs. 30,000

    (b) Rs. 35,000

(c) Rs. 40,000

(d) Rs. 45,000

18. The population of a town increases every year by 2 % of the population beginning of that year. The number of years by which the total increase of population be 40% is

(a) 7 years

(b) 10 years

(c) 17 years (approximately)

(d) none of these

19. Find the future value of an annuity of Rs. 500 made annually for 7 years at interest rate of 14 % per annum [Given that $(1.14)^7 = 2.5023$]

(a) Rs. 5365.35

(b) Rs. 5000

(c) Rs. 5325.65

(d) Rs.6000.35

20. Rs. 200 invested at the end of each month in an account paying interest 6% per year compounded monthly. What is the future value of this annuity after 10^{th} payment? [Given that $(1.005)^{10} = 1.0511$]

(a) Rs. 2045

(b) Rs.5055

(c) Rs.2044

(d) Rs.2065

21. Suppose your father decides to gift you Rs. 10,000 every year starting from today for the next five years, you deposit this amount in a bank as and when you receive and get 10% per annum interest rate compounded annually. What is the present value of this annuity? (P(4, 0.10) = 3.16987)

(a) Rs.41, 698.70

(b) Rs.45, 698.70

(c) Rs.41, 698.70

(d) Rs.41, 698.70

22. Nominal Rate of Return =

(a) Real Rate of Return – Inflation

(b) Real Rate of Return + Inflation

(c) Inflation -Real Rate of return

(d) None of the above

23. Net Present Value (NPV)

(a) Present value of net cash Inflow – Total net Investment

(b) Present value of net cash Inflow – Present value of cash outflow

(c) Total net Investment- Present value of net cash Inflow

(d) a or b

24. The annual birth rates per 1,000 are 39.4 and 19.4 respectively. The number of years which the population will be doubled assuming there is no immigration or emigration is

(a) 35 years

(b) 30 years

(c) 25 years

(d) none of these

25. Y bought Motor Bike Costing 80,000 by making down payment of Rs. 30000 and agreeing to make annual payment for four years. How much would be each payment if the interest on unpaid amount be 14% compounded annually. [Given P (4, 0.14) = 2.91371]

(a) Rs. 17160.25

(b) Rs. 17600.25

(c) Rs.15600.25

(d) Rs. 16600.25

26. The value of K, for which the terms 7K +3, 4K-5, 2K+10 are in A.P., is

(a) 13

(b) - 23

(c) 13

(d) 23

27. If A = {1,2,3,4} and B = {1,4,9,16,25} is a function of f is defined set A to B where $f(x) = x^2$ then the range of f is

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

(b) {1,4,9,16}

(c) {1,4,9,16, 25}

(d) none of these

28. If ${}^nP_r = 336$ and ${}^nC_r = 56$, then n and r will be

(a) (3,2)

(b) (8, 3)

(c) (7, 4)

(d) none of these

29. If A = {1,2,3,4,5,6,7} and B = {2,4,6} Cardinal number of AUB

(a) 3

(b) 16

(c) 5

(d) 7

30. In how many ways the letters of the word 'ARRANGE' be arranged?

(a) 1,200

(b) 1,250

(c) 1,260

(d) 1,300

31. The number of ways in which 8 examination papers be arranged so that the best and worst papers never come together.

(a) 8! - 2× 7!

(b) 8! - 7!

(c) 8!

(d) 7!

32. ${}^{n}P_{r} = 720$ and ${}^{n}C_{r} = 120$ then value of r is

(a) 4

(b) 5

(c) 3

(d) 6

33. Find the three numbers in G.P, whose sum is 19 and product is 216.

(a) 9,6,4 or 4,6,9

(b) 9,6,3 or 3,6,9

(c) 9,3,1 or 1,3,9

(d) 9,3, -1 or -1,3,9

34. The n^{th} term of the sequence -1,2, -4, 8,.is

(a) $(-1)^{n} 2^{n-1}$

(b) 2^{n-1}

(c) 2^{n}

(d) none of these

35. If $f(x) = x+3$ and $g(x) = x^2$, then fog(x)

(a) x^2+3

(b) x^2+x+3

(c) $(x+3)^2$

(d) none of these

36. Given $x = 2t + 5$, $y = t^2 - 2$; $\frac{dy}{dx}$ is calculated

(a) t

(b) -1/t

(c) 1/t

(d) none of these

37. The slope of the tangent to the curve $y = x^2-x$ at the point, where the line $y= 2$ cuts the curve in the first quadrant, is

(a) 2

(b) 3

(c) -3

(d) 2

38. For the curve $x^2+y^2+2gx+2hy = 0$, the value of $\frac{dy}{dx}$ at (0,0) is

(a) -g/h

(b) g/h

(c) h/g

(d) -h/g

39. $\int e^{-3x}dx$ =

(a) $-\frac{1}{3}e^{-3x}+c$

(b) $\frac{1}{3}e^{-3x}+c$

(c) $-\frac{1}{3}e^{3x}+c$

(d) $-3e^{-3x}+c$

40. $\int x.\log dx$

(a) $\frac{x^2}{2}.\log x-\frac{x^2}{4}+c$

(b) $-\frac{x^2}{2}.\log x-\frac{x^2}{4}+c$

(c) $\frac{x^2}{2}.\log x+\frac{x^2}{4}+c$

(d) $-\frac{x^2}{2}.\log x+\frac{x^2}{4}+c$

41. Find the missing term of the number series 24, 60, 120, 210, ?

(a) 300

(b) 336

(c) 420

(d) 525

42. GO = 32, SHE = 49, then SOME will be equal to

(a) 56

(b) 58

(c) 62

(d) 64

43. in a certain Code DECEMBER is written as ERMBCEDE. Which word will be written as ERMBVENO in that code?

(a) AUGUST

(b) SEPTEMBER

(c) OCTOBER

(d) NOVEMBER

44. Find the missing term of the number series 48, 24, 96,48,192,?

(a) 76

(b) 90

(c) 96

(d) 98

45. Ramu walks 5 Kms starting from his house towards west then turns right and walks 3 km. Thereafter he takes left turn and walks 2 km. Further, he turn left and walks 3 km. Finally, he turns right and walks 3 kms. In what direction he is now from his house.

(a) West

(b) North

(c) South

(d) North

46. Six children A, B, C, D, E and F are sitting in a row. B is between F and D. E is between A and C. However, A does not stand next to F or D. C does not stand next to D. F is between which of the following pairs of children?

(a) B and E

(b) B and C

(c) B and D

(d) B and A

47. Five students are A,B,C,D and E are standing in arrow . D is on the right of E; B is on the left of E but on right of A. D is next to C on his left. The student in middle is

(a) B

(b) A

(c) E

(d) C

Q.No.48-50 Study the following information carefully to answer the given questions. Eight person's P to W are sitting in front of one another in two rows. Each row has four persons. P is between U and V and facing North. Q, who is to the immediate left of M is facing W. R is between T and M and W is to the immediate right of V.

48. Who is sitting in front of R?

(a) U

(b) Q

(c) V

(d) P

49. Who is to the immediate right of R?

(a) M

(b) U

(c) M or P

(d) T

50. In which of the following pairs, persons are sitting in front of each other?

(a) MV

(b) RV

(c) TV

(d) UR

(Q.NO. 51-53). In each of the of the following below are given two statements followed by two conclusion numbered I and II. You have to take the given two statements to be true even if they seem to be variance from commonly known facts. Read the conclusions logically follows from the two given statements. Disregarding commonly known facts.

Give Answer

(a) If Only concussion I follows

(b) If Only concussion II follows

(c) If either concussion I or II follows

(d) If neither concussion I nor II follows

51. Statements: I. Some rats are Cats

II. All Cats are bats.

Conclusions: No rats are cats

Some rats are bats.

52. Statements: I. No house is an apartment.

II. Some apartments are bungalows.

Conclusions: No house is a bungalow.

All bungalows being houses is a possibility.

53. Statements: I. All Pens are ink.

II. No ink is an eraser.

Conclusions: No pen is an eraser.

Some erasers are pens.

54. Statements: I. No toffee is Coffee

II. No Sweet is Toffee.

Conclusions: No coffee is sweet.

All sweets are coffee.

55. C is mother of A and B. If D is the husband of B, then what is C to D

(a) Mother

(b) Aunt

(c) Mother-in Law

(d) Sister

56. A is B's sister, C is B's mother, D is C's father of E is D's mother, then how is A related D?

(a) Granddaughter

(b) Daughter

(c) Aunt

(d) Father

57. A, Q, Y and Z are different persons. Z is the father of Q. A is the daughter of Y and Y is the son of Z. If P is the son of Y and B is the brother of P, then

(a) B and Y are brothers

(b) A is sister of B

(c) Z is the uncle of B

(d) Q and Y are brothers

58. A is father of C and D is son of B. E is brother of A. If C is sister of D how is B related to E?

(a) Sister-in-Law

(b) Sister

(c) Brother

(d) Brother-in-Law

59. A Driver left his village and drove North for 20 Km, after which he stopped for breakfast. Then he turned left and drove another 30 km, when he stopped for lunch. After some rest, he again turned left and drove 20 kms before stopping for evening tea. Once more he turned left and drove 30 kms to reach the town where he had supper. After evening tea in which direction did he drive?

(a) West

(b) East

(c) North

(d) South

60. A man is facing East, then he turns left and goes 10m then turns right and goes 5 m then goes 5 m to the South and from there 5 m to West. In which direction is be from his original place?

(a) East

(b) West

(c) North

(d) South

PART B: STATISTICS

61. Statistics is applied in

(a) Economics

(b) Business management

(c) Commerce and industry

(d) All these.

62. The primary data are collected by

(a) Interview method

(b) Observation method

(c) Questionnaire method

(d) All these.

63. The best method to collect data, in case of a natural calamity, is

(a) Personal interview

(b) Indirect interview

(c) Questionnaire method

(d) Direct observation method

64. 'Stub' of a table is the

(a) Left part of the table describing the columns

(b) Right part of the table describing the columns

(c) Right part of the table describing the rows

(d) Left part of the table describing the rows

65. Pie-diagram is used for

(a) Comparing different components and their relation to the total

(b) representing qualitative data in a circle

(c) Representing quantitative data in circle

(d) (b) or (c).

66. For open-end classification, which of the following is the best measure of central tendency?

(a) AM

(b) GM

(c) Median

(d) Mode

67. The presence of extreme observations does not affect

(a) AM

(b) Median

(c) Mode

(d) Any of these.

68. For a moderately skewed distribution, which of the following relationship holds?

(a) Mean – Mode = 3 (Mean – Median)

(b) Median – Mode = 3 (Mean – Median)

(c) Mean – Median = 3 (Mean – Mode)

(d) Mean – Median = 3 (Median – Mode)

69. Which of the following results hold for a set of distinct positive observations?

(a) AM ≥ GM ≥ HM

(b) HM ≥ GM ≥ AM

(c) AM > GM > HM

(d) GM > AM > HM

70. Quartiles are the values dividing a given set of observations into

(a) Two equal parts

(b) Four equal parts

(c) Five equal parts

(d) None of these

71. 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
72. What is the value of the first quartile for observations 15, 18, 10, 20, 23, 28, 12, 16?
    (a) 17
    (b) 16
    (c) 12.75
    (d) 12
73. If the relationship between two variables u and v are given by 2u + v + 7 = 0 and if the AM of u is 10, then the AM of v is
    (a) 17
    (b) –17
    (c) –27
    (d) 27.
74. Which one is an absolute measure of dispersion?
    (a) Range
    (b) Mean Deviation
    (c) Standard Deviation
    (d) All these measures
75. The range of 15, 12, 10, 9, 17, 20 is
    (a) 5
    (b) 12
    (c) 13
    (d) 11.
76. The standard deviation of, 10, 16, 10, 16, 10, 10, 16, 16 is
    (a) 4
    (b) 6
    (c) 3
    (d) 0.
77. If all the observations are multiplied by 2, then
    (a) New SD would be also multiplied by 2
    (b) New SD would be half of the previous SD
    (c) New SD would be increased by 2
    (d) New SD would be decreased by 2.
78. The quartiles of a variable are 45, 52 and 65 respectively. Its quartile deviation is
    (a) 10
    (b) 20

(c) 25

(d) 8.30.

79. If $P(A \cap B) = 0$, then the two events A and B are

(a) Mutually exclusive

(b) Exhaustive

(c) Equally likely

(d) Independent.

80. If A, B and C are mutually exclusive and exhaustive events, then P(A) + P(B) + P(C) equals to

(a) $\frac{1}{3}$

(b) 1

(c) 0

(d) any value between 0 and 1.

81. Variance of a random variable x is given by

(a) $E(x - \mu)^2$

(b) $E[x - E(x)]^2$

(c) $E(x^2 - \mu)$

(d) (a) or (b)

82. If a card is drawn at random from a pack of 52 cards, what is the chance of getting a Spade or an ace?

(a) 4/13

(b) 5/13

(c) 0.25

(d) 0.20

83. Given that P (A) = 1/2, P (B) = 1/3, P (AB) = 1/4, what is P (A'/B')

(a) 1/2

(b) 7/8

(c) 5/8

(d) 2/3

84. A binomial distribution is

(a) never symmetrical.

(b) never positively skewed.

(c) never negatively skewed.

(d) symmetrical when p = 0.5.

85. The maximum value of the variance of a binomial distribution with parameters n and p is

(a) n/2.

(b) n/4.

(c) np (1 – p).

(d) 2n.

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 interval $(\mu - 3\sigma, \mu + 3\sigma)$ covers
    (a) 95% area of a normal distribution.
    (b) 96% area of a normal distribution.
    (c) 99% area of a normal distribution.
    (d) all but 0.27% area of a normal distribution.
88. 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
89. 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
90. For Poisson fitting to an observed frequency distribution
    (a) we equate the Poisson parameter to the mean of the frequency distribution.
    (b) we equate the Poisson parameter to the median of the distribution.
    (c) we equate the Poisson parameter to the mode of the distribution.
    (d) none of these.
91. What is spurious correlation?
    (a) It is a bad relation between two variables.
    (b) It is very low correlation between two variables.
    (c) It is the correlation between two variables having no causal relation.
    (d) It is a negative correlation
92. The covariance between two variables is
    (a) Strictly positive
    (b) Strictly negative
    (c) Always 0
    (d) Either positive or negative or zero.
93. If r = 0.6 then the coefficient of non-determination is
    (a) 0.4
    (b) –0.6
    (c) 0.36

(d) 0.64

94. If the sum of squares of difference of ranks, given by two judges A and B, of 8 students in 21, what is the value of rank correlation coefficient?

(a) 0.7

(b) 0.65

(c) 0.75

(d) 0.8

95. Weighted G.M. of relative formula satisfy _____test

(a) Time Reversal Test

(b) Circular test

(c) Factor Reversal Test

(d) none

96. Laspyre's method and Paasche's method do not satisfy

(a) Unit Test

(b) Time Reversal Test

(c) Factor Reversal Test

(d) a, b and (c)

97. Fisher's index number is based on

(a) The Arithmetic mean of Laspeyre's and Paasche's index numbers.

(b) The Median of Laspeyre's and Paasche's index numbers.

(c) The Mode of Laspeyre's and Paasche's index numbers.

(d) The GM of Laspeyre's and Paasche's index numbers.

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. Damages due to floods, droughts, strikes, fires and political disturbances are :

(a) Trend

(b) Seasonal

(c) Cyclical

(d) Irregular

100. The additive model of Time Series

(a) $Y = T + S + C + I$

(b) $Y = TSCI$

(c) $Y = a + b X$

(d) $Y = a + b X + c X^2$

Test Series: March, 2019

FOUNDATION COURSE

MOCK TEST PAPER

PAPER – 3: BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS

ANSWERS

Part A: Business Mathematics and Logical Reasoning

1	**(a)**	11	**(b)**	21	**(a)**	31	**(a)**	41	**(b)**	51	**(b)**
2	**(c)**	12	**(c)**	22	**(b)**	32	**(c)**	42	**(a)**	52	**(d)**
3	**(a)**	13	**(a)**	23	**(d)**	33	**(a)**	43	**(d)**	53	**(a)**
4	**(a)**	14	**(b)**	24	**(a)**	34	**(a)**	44	**(c)**	54	**(d)**
5	**(a)**	15	**(d)**	25	**(a)**	35	**(a)**	45	**(a)**	55	**(c)**
6	**(b)**	16	**(d)**	26	**(b)**	36	**(a)**	46	**(b)**	56	**(a)**
7	**(a)**	17	**(a)**	27	**(b)**	37	**(b)**	47	**(c)**	57	**(b)**
8	**(a)**	18	**(c)**	28	**(b)**	38	**(a)**	48	**(a)**	58	**(a)**
9	**(c)**	19	**(a)**	29	**(d)**	39	**(a)**	49	**(d)**	59	**(b)**
10	**(d)**	20	**(c)**	30	**(c)**	40	**(a)**	50	**(a)**	60	**(c)**

Part B: Statistics

61	**(d)**	71	**(d)**	81	**(d)**	91	**(c)**
62	**(d)**	72	**(c)**	82	**(a)**	92	**(d)**
63	**(a)**	73	**(c)**	83	**(c)**	93	**(d)**
64	**(d)**	74	**(d)**	84	**(d)**	94	**(c)**
65	**(a)**	75	**(d)**	85	**(b)**	95	**(a)**
66	**(c)**	76	**(c)**	86	**(a)**	96	**(d)**
67	**(b)**	77	**(d)**	87	**(d)**	97	**(d)**
68	**(a)**	78	**(a)**	88	**(b)**	98	**(a)**
69	**(c)**	79	**(a)**	89	**(a)**	99	**(d)**
70	**(a)**	80	**(b)**	90	**(a)**	100	**(a)**