Test Series: November 2023

MOCK TEST PAPER I

FOUNDATION COURSE

PAPER 3: BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS

Time: 2 Hours **Marks: 100**

Part A: Business Mathematics and Logical Reasoning

1. What is the value of $\frac{p+q}{p-q}$ if $\frac{p}{q}=7$

   (a) 4/3

   (b) 2/3

   (c) 2/6

   (d) 7/8

2. If x/2 = y/3 = z/7, then the value of (2x – 5y + 4z)/2y is

   (a) 6/23

   (b) 23/6

   (c) 3/2

   (d) 17/6

3. If x : y = 3 : 4, the value of $x^2y + xy^2 : x^3 + y^3$ is

   (a) 13 : 12

   (b) 12 : 13

   (c) 21 : 31

   (d) none of these

4. If a^x= b, b^y= c, c^z= a, then xyz is

   (a) 1

   (b) 2

   (c) 3

   (d) none of these

5. Given that $\log_{10}2$ = x and $\log_{10}3$ = y, the value of $\log_{10}120$ is expressed as

   (a) 2x – y + 1

   (b) 2x + y + 1

   (c) 2x – y – 1

   (d) none of these

6. The simplified value of $2\log_{10}5 + \log_{10}8 - \frac{1}{2}\log_{10}4$ is

(a) 1/2

(b) 4

(c) 2

(d) none of these

7. If $\log\left(\frac{a+b}{4}\right) = \frac{1}{2}\left(\log a + \log b\right)$ then $\frac{a}{b} + \frac{b}{a}$

(a) 12

(b) 14

(c) 16

(d) 8

8 If $\frac{\sqrt{x+5}+\sqrt{x-16}}{\sqrt{x+5}-\sqrt{x-16}} = \frac{7}{3}$ then x equals

(a) 10

(b) 20

(c) 30

(d) 40

9. If $x = 3^{\frac{1}{4}} + 3^{-\frac{1}{4}}$ and $y = 3^{\frac{1}{4}} - 3^{-\frac{1}{4}}$ then the value $3\left(x^2 + y^2\right)^2$ will be

(a) 12

(b) 18

(c) 46

(d) 64

10. 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

11. If $2x+5 > 3x+2$ and $2x-3 \leq 4x-5$, then x takes which of the following value ?

(a) 4

(b) -4

(c) 2

(d) -2

12 Solve for x of the Inequalities $2 \leq \frac{3x-2}{5} \leq 4$ where $x \in N$

(a) {5,6,7}

(b) {3,4,5,6}

(c) {4,5,6}

(d) {4,5,6,7}

13. The amount charged for a defined length of time for uses of principal, generally on year basis is known as

(a) Balance

(b) Rate of Interest

(c) Principal

(d) Interest

14. The sum required to earn a monthly interest of Rs.1200 at 18% p.a Simple Interest is –

(a) Rs. 50,000

(b) Rs. 60,000

(c) Rs.80,000

(d) None of these

15. Sachin deposited Rs.1,00,000 in his bank for 2 years at simple interest of 6%. How much interest would be he earns? How much final value of deposit

(a) Rs.6,000, Rs, 1,06,000

(b) Rs.15,000, Rs.1,15,000

(c) Rs.11,600, Rs.1,11,600

(d) Rs.12,000, Rs,1, 12,000

16. The ratio of principal and the compounded interest value for three years (Compounded annually) is 216:127. The rate of interest is

(a) 0.1777

(b) 0.1567

(c) 0.1666

(d) 0.1587

17 The Compounded interest Rs.8000 for 6 months at 12% p.a payable quarterly is

(a) Rs.487.20

(b) Rs.480

(c) Rs.380

(d) None of these

18. The annual birth and death rates per 1,000 are 39.4 and 19.4 respectively. The number of years in 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

19. The simple interest on sum of money at 6% p.a for 7 years is equal to twice of simple interest on another sum for 9 years at 5 p.a. The ratio will be

(a) 2:15

(b) 7:15

(c) 15. 7

(d) 1:7

20. Nominal rate of Interest is 9.9 % p.a. If interest is compounded monthly, what will be effective rate of Interest.

(a) 10.36%

(b) 9.36%

(c) 11.36%

(d) 9.9%

21. The population of a town increases by 2% of the population at the beginning of the year. The number of years by which the total increases in population would be 40% is

(a) 7 years

(b) 10 years

(c) 17 years

(d) 19 years

22. A stock pays annually an amount of Rs. 10 from 6^{th} year onwards . What is the present value of perpetuity, if the rate of return is 20%

(a) 20.1

(b) 19.1

(c) 21.1

(d) 22.1

23. A sum of money invested in compounded interest doubles itself in four years. In how many years it becomes 32 times of itself as the same rate of compound interest ?

(a) 12 years

(b) 16 years

(c) 20 years

(d) 24 years

24. Sinking fund factor is the reciprocal of ____

(a) Present value of interest factor of a single cash flow

(b) Present value interest factor of annuity

(c) Future value of Interest factor of annuity

(d) Future value of Interest factor of a single cash flow

25. If 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) 1.587 P

(b) 1.921P

(c) 1.403P

(d) 2.51 P

26. If discounted rate is 14% per annum , then how much company has to papy receive Rs.280 growing at 9% annually forever ?

(a) Rs.5600

(b) Rs.2800

(c) Rs.1400

(d) Rs.4200

27. A bag contains 4 red, 3 black and 2 white balls > In how many ways 3 balls can be drawn from this bag so that they include at least one black ball?

(a) 64

(b) 46

(c) 85

(d) None of the above

28. The number of words from the letters of the word BHARAT, in which B and H will never come together is

(a) 360

(b) 240

(c) 120

(d) None of these

29. The value of N in $\frac{1}{7!}+\frac{1}{8!}=\frac{N}{9!}$ is

(a) 81

(b) 78

(c) 89

(d) 64

30. The 3rd term of a G.P is 2/3 and 6th term is 2/81, then the first term is

(a) 6

(b) 1/3

(c) 9

(d) 2

31. A person pays Rs. 975 in monthly instalments, each instalment is less than former by Rs. 5. The amount of first instalment is Rs. 100. In what time will the entire amount be paid?

(a) 26 months

(b) 15 months

(c) Both (a) & (b)

(d) 18 months

32. If the sum of n terms of an A.P. is $(3n^2 – n)$ and its common difference is 6, then its first term is:

(a) 3

(b) 2

(c) 4

(d) 1

33. In a survey of 300 companies, the number of companies using different media-Newspapers (N), Radio (R) and Television (T) are as follows:

$n(N) = 200$, $n(R) = 100$, $n(T) = 40$, $n(N \cap R) = 50$, $n(R \cap T) = 20$, $n(N \cap R) = 25$, and $n(N \cap R \cap T) = 5$,

Find the numbers of companies using none of these media:

(a) 20 companies

(b) 250 companies

(c) 30 companies

(d) 50 companies

34. If f(x)= x+2 , g(x) = 7^x , then gof (x) =

(a) $7^x.x+2.\ 7^x$

(b) 7^x+2

(c) $49(7^x)$

(d) None of these

35. Let A={1,2,3}, then the relation R= {(1,1), (2.3), (2.2), (3,3), (1,2)} is called

(a) Symmetric

(b) Transitive

(c) Reflexive

(d) Equivalence

36. The cost function for the production of x units of a commodity by C(x) = $2x^3+15x^2+36x+15$ the cost will be minimum when 'x 'is equal to

(a) 3

(b) 2

(c) 1

(d) 4

37. If $f(x) = x_{c_3}$ then f'(1)= ?

(a) 1/6

(b) -1/6

(c) 5/6

(d) -5/6

38. The equation of the curve which passes through the point (1,2) and has the slope 3x-4 and the point of (x, y) is

(a) $2y = 3x^2-8x+9$

(b) $y = 6x^2-8x+9$

(c) $y=x^2-8x+9$

(d) $2y= 3x^2-8x+c$

39. The slope of the tangent to the curve y = $\frac{x-1}{x+2}$ at x=2 is

(a) $\frac{3}{16}$

(b) $-\frac{3}{16}$

(c) $-\frac{1}{4}$

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

40. $\int_0^5 \frac{x^2 dx}{x^2 + (5-x)^2} =$

(a) 5

(b) 5/2

(c) 1

(d) none of these

41. TWENTY is written as 863985 and ELEVEN is written as 323039, then TWELVE can be coded.

(a) 863203

(b) 836203

(c) 826303

(d) 862303

42. Find next number of the series 7, 23, 47, 79, 119, 167, ?

(a) 211

(b) 223

(c) 287

(d) 319

43 Find odd man out: 34, 105, 424, 2123, 12756.

(a) 12756

(b) 2123

(c) 424

(d) 34

44. Find next term of the series A5A, C10C, E15E, G20G ___

(a) I25I

(b) I20I

(c) J25J

(d) K20K

45 Find next term of the letter series QPO, NML, KJI, HGF, ___

(a) EDC

(b) HGE

(c) CAB

(d) GHI

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

(a) 6712

(b) 6198

(c) 6395

(d)6721

47. The length and breadth of a room are 8 metre and 6 metre respectively. A cat runs along all four walls and finally along diagonal order to catch a rat. How much total distance covered by the cat?

(a) 10

(b) 14

(c) 38

(d) 48

48. Ravi left home and cycled 10 km towards South, then turned right and cycled 5 km and then again turned right and cycled 10 km. After this he turned left and cycled 10 km. How many kilometers will he have to cycle to reach his home straight?

(a) 10 km

(b) 15 km

(c) 12 km

(d) 17 km

49. Hari in order to go to university started from his house in the east and came to a crossing. The road to the left ends in a theatre, straight ahead is the hospital. In which direction is the university?

(a) North

(b) South

(c) East

(d) West

50. Shivam started from his house towards west. After walking a distance of 15 m. He turned to the right and walked 10 m. He then again turned to the right and walked 5 m. After this he is to turn right at 135^0 and to cover 10 m. In which direction should he go?

(a) South

(b) South-West

(c) South-East

(d) North

51. If A x B means A is to the south of B; A + B means A is to the north of B; A % B means A is to the east of B; A - B means A is to the west of B; then in P % Q + R - S, S is in which direction with respect to Q?

(a) South -West

(b) South- East

(c) North-East

(d) North-West

52. A, P, R, X, S and Z are sitting in a row. S and Z are in the centre. A and P are at the ends. R is sitting to the left of A. Who is to the right of P?

(a) A

(b) X

(c) S

(d) Z

53. Shyam, Sathish, Amar and Pavan are playing cards. Amar is to the right of Sathish, who is to the right of Shyam. Who is to the right of Amar?

(a) Satish

(b) Amar

(c) Pavan

(d) Shyam

54 In a line P is sitting 13th from left. Q is sitting 24th from the right and 3rd left from P. How many people are sitting are in the line?

(a) 34

(b) 31

(c) 32

(d) 33

55 P is the mother of K , K is the sister of D. D is the father of J . How is P related to J?

(a) Mother

(b) Grandmother

(c) Aunt

(d) Data is in adequate

56. If A+B means B is the brother of A; A×B means B is the husband of A; A−B means A is the mother of B and A % B means A is the father of B, which of the following relations shows that Q is the grandmother of T ?

(a) Q-P+R%T

(b) PXQ%R-T

(c) P×Q%R+T

(d) P+Q%R-T

57. Read the following instructions:

P $ Q means P is the brother of Q;

P # Q means P is the mother of Q;

P * Q means P is the daughter of Q

If the code of family is A # B $ C * D, who is the father in them?

(a) D

(b) B

(c) C

(d) A

(58-59) There are seven members A, C, D, E, F, G and H in a family. There are two fathers, one mother, two sisters and four brothers. E is a sister-in-law of D. G is a daughter of C. F is the brother of E. A is a grandfather of G. E is a mother of H.

58) How is H related to A?

(a) Grandson

(b) Granddaughter

(c) Son

(d) Cannot be determined

59. How many male members in the family?

(a) 4

(b) 5

(c) 3

(d) Data Inadequate

60. A is B's sister. C is B's mother. D is C's father. E is D's mother. Then how A is related to D.

(a) Grandfather

(b) Grandmother

(c) Daughter

(d) Granddaughter

Part B – Statistics

61. A tabular presentation Can be Used for
    (a) Continuous data
    (b) Nominal data
    (c) Time Series data
    (d) Comparing different components

62. When data are classified according one criterion, then it is called --------- classification
    (a) quantitative
    (b) qualitative
    (c) Simple
    (d) factored

63. Census report are used as source of _____ data.
    (a) Secondary
    (b) Primary
    (c) Organize
    (d) Confidential

64. In a graphical representation of data , the largest numerical value is 45 the smallest numerical value is 25. If classes desired are 4 then which class interval is
    (a) 45
    (b) 5
    (c) 20
    (d) 7.5

65 A student marks in five subjects S1, S2, S3, , S4 and S5 are 86, 79, 90, 88 and 89 . If we need to draw a pie chart to represent these marks, what will be central angle for S3.
    (a) 103.2^0
    (b) 75^0
    (c) 105.6^o
    (d) 94.8^O

66. The median following numbers , which are given in ascending order is 25. Find the value of x

    11, 13 , 15 , 19 , (x+2) , (x+4) , 30, 35, 39, 46
    (a) 22
    (b) 20
    (c) 15
    (d) 30

67. The mean salary of a group of 50 persons is Rs. 5850. Later on it is discovered that the salary of one has been wrongly taken as Rs.8000 instead of RS. 7800. The corrected mean salary is

(a) Rs.5854

(b) Rs.5846

(c) Rs.5640

(d) none

68. If the mode of a data is 18 and mean is 24, then median is

(a) 18

(b) 24

(c) 22

(d) 21

69. If 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

70. Orgin is shifted by 5, what will happen

(a) SD will increase by 5

(b) QD will increase by 5

(c) MD will increase by 5

(d) There will be no change in SD

71. The third decile for the numbers 15, 10, ,25, 18, 11, 9 and 12 is

(a) 13

(b) 10.70

(c) 11

(d) 11.50

72. The Harmonic mean H of two numbers is 4 and their arithmetic means A and the geometric mean G satisfy the equation $2A+G^2=27$, the numbers are

(a) (1,3)

(b) (9,5)

(c) (6,3)

(d) (12,7)

73 .If mean and coefficient of variation of the marks of 10 students is 20 and 80 respectively. What will be the variance of them ?

(a) 256

(b) 16

(c) 25

(d) none of these

74. If the same amount is added or subtracted from all the of an individual series then the standard deviation and variance both shall be ___

(a) Changed

(b) Unchanged

(c) Same

(d) none of these

75. The algebraic sum of the deviations of set of values from their arithmetic mean is

(a) >0

(b) <0

(c) 0

(d) None of these

76. The AM of 15 observations is 9 and the AM of first 9 observations is 11 and then AM of remaining observations is

(a) 11

(b) 6

(c) 5

(d) 9

77. If $P(A \cap B) = 0.10$, and $P(B') = 0.80$, then $P(A/B)$ is

(a) 0.25

(b) 0.40

(c) 0.50

(d) 0.75

78. In connection with random experiment, it is found that $P(A) = 2/3$, $P(B) = 3/5$ and $P(A \cup B) = 5/6$

Find $P(A'/B)$

(a) 13/18

(b) ½

(c) 13/20

(d) 5/18

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

(a) 4/13

(b) 5/13

(c) 0.25

(d) 0.20

80. The chance of getting a sum of 10 in a simple single throw is

(a) 10/36

(b) 1/12

(c) 1/12

(d) none

81. A dice is rolled thrice , if getting a four is considered a success , find the variance of the probability distribution of number of successes

(a) ½

(b) ¼

(c) 5/12

(d) 7/12

82. The probability that A speaks truth is 4/5 while this probability for B is 3/4. The probability that they contradict each other when asked to speak on a fact is

(a) 3/20

(b) 1/5

(c) 7/20

(d) 4/5

83 A random variable x follows Binomial Distribution With E(x) = 2 and V(x) =1.2, then the value of n is

(a) 8

(b) 2

(c) 5

(d) none

84. If x is binomial variate with parameter 15 and 1/3, what is mode of the distribution?

(a) 5 and 6

(b) 5

(c) 5.50

(d) 6

85. The mean deviation abut median of standard normal variate is
    (a) 0.675σ
    (b) 0.675
    (c) 0.80σ
    (d) 0.80

86. If the Quartile Deviation of a normal distribution with mean 10 and SD 4 is
    (a) 0.675
    (b) 67.50
    (c) 2.70
    (d) 3.20

87. If the two Quartiles $N(\mu,\sigma^2)$ are 14.6 and 25.4 respectively. What is the standard deviation of the distribution?
    (a) 9
    (b) 6
    (c) 10
    (d) 8

88. When 'p is large than 0.5, the Binomial Distribution is
    (a) Asymmetrical
    (b) Symmetrical
    (c) Both
    (d) None

89. A die is thrown 100 times .if getting an even number is considered a success then the variance number of success.
    (a) 50
    (b) 25
    (c) 10
    (d) 100

90. Two regression lines are perpendicular each other of r =
    (a) 0
    (b) +1
    (c) -1

(d) ± 1

91. If r = 0.6, then the coefficient of non -determination is
    (a) 0.4
    (b) -0.6
    (c) 0.36
    (d) 0.64

92. The sum of the squares of differences in ranks of marks obtained in Physics and Chemistry by 10 students in a test is 150, then the coefficient of rank correlation by :
    (a) 0.849
    (b) 0.091
    (c) 0.909
    (d) None of these

93. If one regression coefficient is ____ unity, the other must be ____Unity
    (a) more than, more than
    (b) less than, less than
    (c) more than, less than
    (d) positive, negative

94. Find the coefficient of correlation 2x+3y= 2 and 4x+3y= 4
    (a) -0.71
    (b) 0.71
    (c) -0.5
    (d) 0.5

95. If the coefficient of correlation between x and y is 0.5, the covariance is 16 and if the Standard deviation of X =4 then Standard deviation of y is
    (a) 4
    (b) 8
    (c) 16
    (d) 64

96. Fisher index number is _____of Laspyres and Paasches Index Number
    (a) A.M
    (b) G.M
    (c) H.M

(d) None of these

97. Circular test is satisfied by which of the following index?
    (a) Laspeyres index
    (b) Paasche's index
    (c) Fisher's index
    (d) Simple geometric mean of price relatives

98. $\sum P_0Q_0=1360$, .$\sum P_nQ_0=1900$, .$\sum P_0Q_n=1344$, .$\sum P_nQ_n=1880$, then the Laspyres Index number is
    (a) 71
    (b) 139.70
    (c) 175
    (d) none of these

99. If Laspyres Index number is 250 and Paasches Index number is 160, then Fishers Index number is
    (a) 200
    (b) 400
    (c) 250
    (d) 196

100 The cost of Index number is always
    (a) Price Index number
    (b) Quantity Index number
    (c) Weighted Index number
    (d) Value index number