

MOCK TEST PAPER 1

FOUNDATION COURSE

PAPER 3: BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS

Time: 2 hours

Marks: 100

Section A : Business Mathematics and Logical Reasoning

1. The ratio of the earnings of two persons 3:2. If each saves $\frac{1}{5}$ th of their earnings, the ratio of their savings.
 - (a) 2:3
 - (b) 3:2
 - (c) 4:5
 - (d) 5:4
2. The Third Proportional to 15 and 20 is
 - (a) $\frac{80}{3}$
 - (b) 80
 - (c) $\frac{80}{7}$
 - (d) 120
3. If $\log_9 x + \log_3 x = \frac{3}{2}$ then x is
 - (a) 0
 - (b) 1
 - (c) $\frac{9}{4}$
 - (d) 3
4. If x+y, y+z, z+x are in the ratio 6:7:8 and x + y + z =14 then the value of x is
 - (a) 6
 - (b) $\frac{14}{3}$
 - (c) 8
 - (d) 10
5. If $2^x = 3^y = 6^z$ then $\frac{1}{x} + \frac{1}{y} =$
 - (a) $\frac{1}{z}$
 - (b) $\frac{1}{z} - \frac{1}{x}$
 - (c) $\frac{1}{z} + \frac{1}{x}$

- (d) 0
6. 5 chairs and 3 tables cost of Rs.350. and 3 Chairs and 5 tables cost Rs.370. What is the cost of the table and two chairs?
- (a) Rs.130
(b) Rs. 120
(c) Rs.150
(d) Rs.140
7. If one root of the quadratic equation is $2 + \sqrt{3}$, the equation is ____
- (a) $x^2 - 4x + 1 = 0$
(a) $x^2 + 4x + 1 = 0$
(c) $x^2 - 4x - 1 = 0$
(d) None of these
8. 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 Age
- (a) 9
(b) 8
(c) 10
(d) 12
9. Let $A = \begin{pmatrix} 2 & 3 \\ 4 & 5 \end{pmatrix}$; $B = \begin{pmatrix} 1 & 5 \\ 6 & 7 \end{pmatrix}$ then the value $A-3B$
- (a) $\begin{pmatrix} -1 & -12 \\ -14 & -16 \end{pmatrix}$
(b) $\begin{pmatrix} 1 & -12 \\ -14 & 16 \end{pmatrix}$
(c) $\begin{pmatrix} -1 & 12 \\ -14 & 16 \end{pmatrix}$
(d) $\begin{pmatrix} 1 & 12 \\ 14 & 16 \end{pmatrix}$
10. $\begin{pmatrix} a & -b \\ b & a \end{pmatrix} \times \begin{pmatrix} -a & b \\ b & a \end{pmatrix}$
- (a) $\begin{pmatrix} a^2 + b^2 & 0 \\ 0 & a^2 + b^2 \end{pmatrix}$
(b) $\begin{pmatrix} -a^2 - b^2 & 0 \\ 0 & a^2 + b^2 \end{pmatrix}$

(c) $\begin{pmatrix} a^2 - b^2 & 0 \\ 0 & a^2 + b^2 \end{pmatrix}$

(d) $\begin{pmatrix} a^2 - b^2 & 0 \\ 0 & a^2 - b^2 \end{pmatrix}$

11. The solution set of the in equation $x + 2 > 0$ and $2x - 6 > 0$ is
- $(-2, \infty)$
 - $(3, \infty)$
 - $(-\infty, 2)$
 - $(-\infty, -2)$
12. A company produces two products A and B, each of which requires processing in two machines. The first machine can be used at most for 60 hours, the second machine can be used at most for 40 hours. The product A requires 2 hours on machine one and one hour on machine two. The product B requires one hour on machine one and two hours on machine two. Express above situation using linear inequalities.
- $2x + y \leq 60$ and $x + 2y \geq 40$.
 - $2x + y \geq 60$ and $x + 2y \geq 40$.
 - $2x + y \leq 60$ and $x + 2y \leq 40$.
 - $2x + y \geq 60$ and $x + 2y \leq 40$.
13. Rs. 1000 is invested at annual rate of interest of 10% p.a. The amount after two years if compounding is done annually is _____
- Rs. 121
 - Rs. 1210
 - Rs. 2110
 - None of these
14. If A person invests Rs.3,000 in a three years' investment that pays you 12% per annum. Calculate the future value of the investment.
- Rs.4214.78
 - Rs. 4124.78
 - Rs.4324.48
 - Rs.4526.48
15. A person deposited a sum of Rs. 10,000 in a bank. After 2 years, he withdrew Rs. 4,000 and at the end of 5 years, he received an amount of Rs. 7,900; then the rate of simple interest is:
- 6%
 - 5%
 - 10%
 - None of these
16. A company is considering proposal of purchasing a machine either by making full payment of Rs.4000 or by leasing it for four years at an annual rate of Rs.1250. Which course of action is preferable if the company can borrow money at 14% compounded annually? $[P(4, 0.14) = 2.9137]$
- leasing is not preferable

- (b) leasing is preferable
 - (c) cannot determined
 - (d) none of these
17. Anil bought a motor cycle costing Rs.1,30,000 by making a down payment of Rs.30, 000 and agreeing to make equal annual payment for five years. How much would be each payment if the interest on unpaid amount be 10% compounded annually? [$P(5, 0.10) = 3.7908$]
- (a) Rs.28379.70
 - (b) Rs.26300.70
 - (c) Rs.26500.70
 - (d) Rs.26379.70
18. Shoba borrows Rs.50,00,000 to buy a house. If he pays equal instalments for 20 years and 10% interest on outstanding balance, what will be the equal annual instalment?
[Given : $P(20,0.10) = 8.51356$]
- (a) Rs.687298.4
 - (b) Rs.685298.4
 - (c) Rs.585298.4
 - (d) Rs.587298.4
19. A trust fund has invested Rs. 30,000 in two different types of bonds which pays 5% and 7% interest respectively. Determine how much amount is invested in each type of bond if trust obtains an annual total interest of Rs. 1600.
- (a) Rs.5000
 - (b) Rs.6000
 - (c) Rs.7000
 - (d) Rs. 8000
20. An overdraft of Rs. 50,000 to be paid back in equal annual installments over a period of 20 years. Find the value of Installment, if interest is compounded annually at 14% per annum.
[Given $(1.14)^{20} = 13.74349$]
- (a) Rs .550.50
 - (b) Rs .549.30
 - (c) Rs .559.50
 - (d) Rs .560.50
21. At six months' intervals A deposited of Rs. 1000 in a savings account which credit interest at 10% p.a., compounded semi-annually. The first deposit was made when A's son was 6 months old and last deposit was made when his son was 8 years old. The money remained in the account and was presented to the son on his 10th birthday. How much did he receive? $(1.06)^{16} = 2.1829$
- (a) Rs.25740
 - (b) Rs.23740
 - (c) Rs.25860
 - (d) Rs.25760

22. What is the effective rate of interest if the nominal rate 5 % p.a converted quarterly?
- (a) 6.09 %
 - (b) 5.09 %
 - (c) 5.55%
 - (d) 5.60 %
23. A sum of money doubles itself at compound interest in 10 years. In how many years will it become eight times?
- (a) 20
 - (b) 30
 - (c) 40
 - (d) 35
24. Certain sum of money borrowed at simple interest amount to Rs.2688 in three years and to Rs.2784 in four years at the rate per annum equal to
- (a) 7%
 - (b) 6%
 - (c) 5%
 - (d) 4%
25. In how many ways can a committee of 3 ladies and four gents be chosen from 8 ladies and 7 gents?
- (a) 1950
 - (b) 1920
 - (c) 1940
 - (d) 1960
26. In how many ways can the letters of the word 'STRANGE' be arranged so that the vowels never come together?
- (a) 3600
 - (b) 3686
 - (c) 5040
 - (d) 4050
27. A box contains 7 red, 6 white and 4 blue balls. How many selections of three balls on of each colour?
- (a) 178
 - (b) 158
 - (c) 198
 - (d) 168
28. The number of diagonals in a polygon of 6 sides
- (a) 9
 - (b) 8
 - (c) 6
 - (d) 12

29. If $A = \{1, 2, 3, 4, 5\}$ and $B = \{6, 7, 8\}$, then cardinal number of $A \times B$ is:
- 15
 - 5
 - 3
 - 8
30. The number of subsets of the set $A = \{1, 2, 3, 4, 5, 6, 7, 8\}$ is
- 36
 - 128
 - 256
 - None of these
31. If $f(x) = \left(\frac{x^2 - 4}{x - 2} \right)$, then $f(2)$ is
- 0
 - 2
 - 4
 - 1
32. The first term of an A.P. is 100 and the sum of whose first 6 terms is 5 times the sum of the next 6 terms, then the c.d. is –
- 10
 - 10
 - 5
 - None of these
33. The sum of n terms of an A.P. is $3n^2 + n$; then its p^{th} term is
- $6P + 2$
 - $6P - 2$
 - $6P - 1$
 - None of these
34. if three AM's between 3 and 11, they are
- 4, 6, 8
 - 3, 5, 7
 - 5, 7, 9
 - $11/2, 15/2, 19/2$
35. If $y^3 \cdot x^5 = (x+y)^8$, then $\frac{dy}{dx}$ is
- $\frac{y}{x}$
 - $\frac{-y}{x}$

- (c) $\frac{y^5}{x^3}$
- (d) None of these
36. If $f'(x) = 3x^2 + 2$ & $f(0) = 0$ then find $f(2)$.
- (a) 8
- (b) 10
- (c) 12
- (d) None of these
37. The gradient of the curve $x^3 + y^3 = 9$ at the point (1,2) is
- (a) $-1/4$
- (b) $1/4$
- (c) 4
- (d) -4
38. If $x = \frac{2t}{1+t^2}$, $y = \frac{1-t^2}{1+t^2}$ then $\frac{dy}{dx} + \frac{x}{y}$ is
- (a) 1
- (b) 2
- (c) 0
- (d) $4t^2$
39. Evaluate $\int \frac{2x+1}{x(x+1)} dx$
- (a) $\log(x^2 - x) + c$
- (b) $\log(x^2 + x) + c$
- (c) $\log(x^2 + 1) + c$
- (d) None of these
40. Evaluate $\int_0^1 x.e^x dx$
- (a) e
- (b) e-1
- (c) 2e
- (d) 1

Logical Reasoning

41. Find the missing term of the series 17, 14, 15, 12, 13, ?, ?
- (a) 10, 11
- (b) 14, 11

- (c) 11, 13
(d) 12, 13
42. Find out the odd man out of the series 5, 27, 61, 122, 213, 340, 509
(a) 27
(b) 61
(c) 122
(d) 509
43. a_c_ba_ca_cb
(a) abcc
(b) acba
(c) bcaa
(d) bcba
44. In a certain language TWINKLE is written as SVHOJKD, then how would FILTERS be written in the same code?
(a) EHKUDQR
(b) ITNFKD
(c) KVOHMF
(d) TIMFKD
45. C is mother of A and B. If D is husband of B, then what is C to D?
(a) Mother
(b) Aunt
(c) Mother-in-law
(d) Sister
46. Read the following information carefully to answer the questions that follow.
I. 'P + Q' means 'P is father of Q'
II. 'P - Q' means 'P is mother of Q'
III. 'P × Q' means 'P is brother of Q'
IV. 'P ÷ Q' means 'P is sister of Q'
Which of the following means 'M' is maternal uncle of T?
(a) $M \div K - T$
(b) $M \times K - T$
(c) $M \times K + T$
(d) $M \div K + T$
47. Pointing a man to photo graph, a man is said to a woman, "His mother is the only daughter of your father". How is the woman is related to the man in the photograph?
(a) Sister
(b) Mother
(c) Wife

- (d) Daughter
48. Moni is daughter of Sheela. Sheela is wife of my wife's brother. How Moni is related to my wife?
- (a) Cousin
(b) Niece
(c) Sister
(d) Sister-in-law
49. Four girls A, B, C and D are sitting around a circle facing the centre. B and C are in front of each other, which of the following is definitely true?
- (a) A and D are in front of each other
(b) A is not between B and C
(c) D is to the left of C
(d) A is to the left of C
50. Seven children A, B, C, D, E, F and G are sitting in a row. G is to be right of D and to the left of B. A is on the right of C, A and D have one child between them. E and B have two children between them. Who is exactly in the middle?
- (a) A
(b) C
(c) D
(d) G
51. A man starts for his office in the North direction, he turns to his left, and then to his right and again to his right. In which direction he will be facing?
- (a) North
(b) South
(c) East
(d) North
52. Pramila is going towards East. She turns left, moves on same distance and again turns to her left. After walking some distance, she turns to her right and moves on. In which direction she is going now?
- (a) North
(b) South
(c) North-West
(d) West
53. Six friends A, B, C, D, E and F are sitting in row facing East. "C" is between 'A' and 'E'. 'B' is just to the right of 'E' but left of 'D'. 'F' is not right end. How many persons are to the left of E ?
- (a) 1
(b) 2
(c) 3
(d) 4
54. If 'MEAT' is written as 'TEAM', then 'BALE' is written as
- (a) ELAB
(b) EABL

- (c) EBLA
(d) EALB
55. Town D is 12 km towards the North of A. Town C is 15 km towards the West of town D. Town B is 15 km towards the west of town A, how far and which direction is town B from town C ?
(a) 15 Km towards North
(b) 12 Km towards North
(c) 3 km towards South
(d) 12 km towards South
56. Rajiv walks 10 m South from his house, turns left and walks 25 m, again turns left and walks 40 m, then turns right and walks 5 m to reach the college. In which direction is the college from his house
(a) North
(b) South-West
(c) North-East
(d) East

(57-60) Each of the following questions contains two statements followed by two conclusions numbered I and II. You have to consider the two statements to be true, even if they seem to be at variance at the commonly known facts. You have to decide which of the given conclusions definitely follows from the given statements

Give answer (a) if only I follows; (b) if only conclusion II follows; (c) both I and II follows and (d) if neither I nor II follows:

57. Statements: I. Some books are magazines.
II. Some magazines are novels
Conclusions: I. Some books are novels
II. Some novels are magazines.
58. Statements: I. Some scales are pencils.
II. Some erasers are pencils.
Conclusions: I. Some pencils are erasers.
II. Some pencils are scales.
59. Statements: I. Some bikes are vans.
II: All vans are trains.
Conclusions: I. Some bikes are trains.
II. No van is a bike.
60. Statements: I. No month is a year.
II. No year is second.
Conclusions: I. All months are second.
II. No Second is month.

Part B Statistics (40 Marks)

61. The number of times a particular item occurs in a given data is called its
- (a) Variation
 - (b) Frequency
 - (c) Cumulative frequency
 - (d) None of these
62. Frequency density is used in the construction of
- (a) Histogram
 - (b) Ogive
 - (c) Frequency polygon
 - (d) None of these
63. The width of each of ten classes in a frequency distribution is 2.5 and the lower class boundary of the lowest class is 10.6. Which one of the following is the upper class boundary of the highest class?
- (a) 35.6
 - (b) 33.1
 - (c) 30.6
 - (d) None of these
64. Let L be the lower class boundary of a class in a frequency distribution and m be the mid point of the class. Which one of the following is the higher class boundary of the class?
- (a) $m + \frac{m+2}{2}$
 - (b) $L + \frac{m+L}{2}$
 - (c) $2m-L$
 - (d) $m - 2L$
65. The mean of the values of 1, 2, 3, n with respective frequencies x, 2x, 3x, nx is
- (a) $\frac{n+1}{2}$
 - (b) $\frac{n}{2}$
 - (c) $\frac{2n+1}{3}$
 - (d) $\frac{2n+1}{6}$
66. The mean of four observations is 10 and when a constant a is added to each observation, the mean becomes 13. The value of a is
- (a) 2
 - (b) -3
 - (c) 3

- (d) None of these
67. A person travels from A to B at the rate of 20 km/hr and from B to A at the rate of 30km/hr. What is the average rate of whole journey ?
- (a) 30 km/ hr.
(b) 24 km/hr.
(c) 35 km/hr.
(d) none of these
68. The average salary of a group of unskilled workers is Rs.10,000 and that of a group of skilled workers is Rs.15,000. If the combined salary is Rs.12,000, then what is the percentage of skilled workers?
- (a) 40%
(b) 50%
(c) 60%
(d) none of these
69. The third decile for the numbers 15, 10, 20, 25, 18, 11, 9, 12 is
- (a) 13
(b) 10.70
(c) 11
(d) 11.50
70. If the SD of x is 3, what is the variance of $(5-2x)$?
- (a) 36
(b) 6
(c) 1
(d) 9
71. If the values of all observations are equal then the Standard Deviation of the given observations is
- (a) 0
(b) 2
(c) 1
(d) None of these
72. The Standard Deviation of a set of 50 items is 10. Find the Standard Deviation if every item is increased by 5.
- (a) 15
(b) 5
(c) 10
(d) None of these
73. Find the coefficient of variation if the sum of squared deviations taken from mean 40 of 10 observations is 360.
- (a) 15
(b) 20
(c) 40

- (d) None of these
74. The average of n numbers is x . If each of the numbers is multiplied by $(n+1)$; then the average of new set of numbers is
- (a) x
- (b) $\frac{x}{n+1}$
- (c) $(n+1).x$
- (d) None of these
75. The average weight of 8 person increases by 1.5 kg, if a person weighing 65 kg replaced by a new person, what would be the weight of the new person?
- (a) 76 kg
- (b) 80 kg
- (c) 77 kg
- (d) None of these
76. For open-end classification, which of the following is the best measure of central tendency?
- (a) AM
- (b) GM
- (c) Median
- (d) Mode
77. The presence of extreme observations does not affect
- (a) AM
- (b) Median
- (c) Mode
- (d) Any of these.
78. Two variables x and y are given by $y = 2x - 3$. If the median of x is 20, what is the median of y ?
- (a) 20
- (b) 40
- (c) 37
- (d) 35
79. If one card is drawn at random from a pack of playing cards; find the probability it is neither a hearts nor a club:
- (a) $\frac{1}{2}$
- (b) $\frac{1}{4}$
- (c) $\frac{1}{8}$
- (d) None of these

80. Three balls are drawn at random from a bag containing 6 blue and 4 red balls. What is the chance that 2 balls are blue and 1 is red?
- (a) $\frac{1}{4}$
 (b) $\frac{3}{4}$
 (c) $\frac{1}{2}$
 (d) None of these
81. The probability that a person travels by a plane is $\frac{1}{5}$ and that he travels by train is $\frac{2}{3}$. Find the probability of his traveling neither by plane nor by train?
- (a) $\frac{13}{15}$
 (b) $\frac{2}{15}$
 (c) $\frac{1}{15}$
 (d) None of these
82. Find the probability that at least 5 defective bolts will be found in a box of 200 bolts. If it is known that 2% of such bolts are expected to be defective (Given: $e^{-4} = 0.0183$)
- (a) 0.4717
 (b) 0.3717
 (c) 0.3017
 (d) None of these
83. Let X be a random variable with the following distribution

X	-2	4	8
P(x)	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$

Find expected value of the random variable

- (a) 5
 (b) 6
 (c) 7
 (d) 8
84. If x & y are two independent variables such that $x \sim B(n_1, P)$ and $y \sim B(n_2, p)$ then the parameter of $Z = x+y$ is
- (a) $(n_1+n_2), P$
 (b) $(n_1-n_2), P$
 (c) $(n_1+n_2), 2P$
 (d) None of these

85. Five coins tossed 3200 times. The number of times 5 heads appeared is
- 500
 - 1200
 - 200
 - 100
86. For the normal distribution density function $f(x) = k \cdot e^{\frac{(x^2-6x+9)}{8}}$, the mean and variance are
- (2,3)
 - (3,2)
 - (4,3)
 - (3,4)
87. The mean deviation of normal distribution is 16. The Quartile Deviation is
- 40/3
 - 20/3
 - 100/3
 - 50/3
88. The Quartile Deviation of the normal distribution $f(x) = \frac{1}{\sqrt{18\pi}} e^{\frac{-(x-10)^2}{18}}$, $-\infty < x < \infty$ is
- 3
 - 4/3
 - 2
 - $\frac{3}{4}$
89. If x and y are two independent normal random distributions with mean and SD's are (10, 5) and (15, 12) these mean and SD of (x+y) is
- (27, 15)
 - (10, 27)
 - (25,13)
 - (12,25)
90. If two variables are independent their covariance is
- 1
 - 1
 - 0
 - None of these

91. If two regression coefficients are 4 and 16, the percentage of unexplained variation is
- (a) 64
 - (b) 36
 - (c) 54
 - (d) 46
92. The covariance between two variables x and y is 72. The variances of x and y are 144 and 84. The coefficient of correlation is
- (a) $1/3$
 - (b) $4/5$
 - (c) $2/3$
 - (d) $3/5$
93. If the coefficient of determination is 0.64 and the regression coefficient of x on y is 4 then the regression coefficient y on x is
- (a) 0.32
 - (b) 0.16
 - (c) 0.48
 - (d) 0.96
94. Circular test is the extension of
- (a) Unit test
 - (b) Factor reversal test
 - (c) Time reversal test
 - (d) None of these
95. Unit test is satisfied by by
- (a) Fischers Index number
 - (b) Laspyers Index number
 - (c) Simple GM of price relatives
 - (d) Bowleys Index number
96. The best average construction of Index number is
- (a) AM
 - (b) GM
 - (c) HM
 - (d) none of these
97. The Paasches and Fishers index numbers are 169 and 156 respectively, then Laspyre's Index number is
- (a) 144

- (b) 152
 - (c) 148
 - (d) 151.5
98. The rise and fall of a time series over periods longer than one year is called:
- (a) Secular trend
 - (b) Seasonal variation
 - (c) Cyclical Variation
 - (d) irregular variations
99. A time series has
- (a) Two Components
 - (b) Three Components
 - (c) Four Components
 - (d) Five Components
100. What is Spurious correlation?
- (a) It is bad relation between two variables
 - (b) It is low correlation between two variables
 - (c) It is the correlation between two variables having no casual relation
 - (d) It is negative correlation