

**SRI GURU SARVA INSTITUTE OF MANAGEMENT, TIRUPUR****CA FOUNDATION – MODEL TEST 1**

Total Marks: 100

**Business Mathematics and Logical Reasoning & Statistics**

Time: 2 hours

Total No. of Questions: 100

No. of Printed pages: 5

**PART –A BUSINESS MATHEMATICS**

- $\int \frac{(2x+3)}{x^2+3x+7} dx$  is equal to  
(a)  $\sqrt{2x+3} + c$  (b)  $\sqrt{x^2+3x+7} + c$  (c)  $\log [x^2+3x+7] + c$  (d)  $\log \sqrt{x^2+3x+7} + c$
- If  $y = (e^x)^{\log x}$ , then  $\frac{dy}{dx}$  is equal to  
(a)  $(1+\log x)$  (b)  $y(1+\log x)$  (c)  $y(1+(\log x)^2)$  (d) None
- If  $A = \{a,b\}$ ;  $B = \{c,d,e\}$  and  $C = \{c,d,e,f\}$  then  $n(A \cap (B \cap C))$  is equal to  
(a) 5 (b) 6 (c) 7 (d) None of these
- Let  $a$  be the AM and  $b, c$  be two GMs between two positive numbers. Then,  $\frac{b^3+c^3}{abc}$  is equal to  
(a) 0 (b)  $\pm 2$  (c) -2 (d) 2
- At what rate of interest would an amount become 3 times in 10 yr?  
(a) 11.6% (b) 11% (c) 12% (d) None
- If  $x : y = 3 : 2$ ;  $y : z = 3 : 5$ , then  $x : y : z$  is  
(a) 9:6:10 (b) 10 : 9 : 6 (c) 12 : 9 : 6 (d) None
- If  $\log_e 2 \log_x 625 = \log_{10} 16 \log_e 10$ , then  $x$  is  
(a) 7 (b) 5 (c) 8 (d) None
- In how many ways can the letters of the word "DIRECTOR" be arranged so that the three vowels are never together?  
(a) 39600 (b) 18000 (c) 18002 (d) None of these
- Evaluate  $\int \frac{e^x(x^2+1)}{(x+1)^2} dx$   
(a)  $e^x \left[ \frac{x-1}{x+1} \right] + c$  (b)  $e^x \left[ \frac{x+1}{x-1} \right] + c$  (c)  $-e^x \left[ \frac{x-1}{x+1} \right] + c$  (d) None
- If  $\alpha$  and  $\beta$  are the roots of the equation  $x^2 - q(1+x) - r = 0$ , then the value of  $(1+\alpha)(1+\beta)$  is  
(a)  $1-r$  (b)  $1+r$  (c)  $q-r$  (d)  $q+r$
- If  $\log_2 x + \log_8 x + \log_{32} x = \frac{23}{15}$ , then the value of  $x$  is  
(a) 8 (b) 5 (c) 2 (d) None of these
- There are 3 copies each of two books and two copies each of five books. In how many ways can a book seller arrange the 16 books in a shelf, so that the copies of the same book are never separated?  
(a) 5040 (b) 5030 (c) 5000 (d) None of these
- The compound ratio of 4 : 3, 9 : 13, 26 : 5 and 2 : 15 is  
(a)  $\frac{4}{25}$  (b)  $\frac{16}{25}$  (c)  $\frac{18}{27}$  (d) None
- Earnings from a new machine after taxes (cost savings or profits) are expected to be Rs. 34,000 per year. The machine costs Rs. 150000 and after 5 yr, it has no resale value. A loan can be made for this amount payable in five equal annual installments at 5% per annum on the unpaid balance of the loan. Should management buy the machine?  
(a) It should not be purchased (b) It should be purchased (c) Cannot determined (d) None
- The sum of the digits of a two digit number is 12. If the digits are reversed, the number is decreased by 18, Find the number  
(a) 75 (b) 93 (c) 84 (d) 57
- Two vessels contain equal quantity of mixtures of milk and water in the ratio 5 : 2 and 6 : 1 respectively. Both the mixtures are now mixed thoroughly. Find the ratio of water to milk in the new mixture so obtained  
(a) 3 : 11 (b) 11 : 3 (c) 30 : 2 (d) 2 : 30
- If  $a^x = b^y = c^z$  and  $x, y, z$  in GP, then  $\log a, \log b$  and  $\log c$  are in  
(a) AP (b) GP (c) Both AP and GP (d) None
- How many 3-digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9 Which are divisible by 5 and none of the digits is repeated ? (a) 5 (b) 60 (c) 100 (d) 20

19. Evaluate  $\int \frac{1}{3x^2 + 13x - 10} dx$   
 (a)  $\frac{1}{17} \log \left[ \frac{3x^2 - 2}{3x^2 + 15} \right] + c$  (b)  $\frac{1}{17} \log \left[ \frac{3x-2}{x+5} \right] + c$  (c)  $\frac{1}{17} \log \left[ \frac{3x+15}{3x-2} \right] + c$  (d) None
20. If  $y^3 x^5 = (x + y)^8$ , then  $\frac{dy}{dx}$  is  
 (a)  $\frac{y}{x}$  (b)  $\frac{-y}{x}$  (c)  $\frac{y^2}{x^3}$  (d) None of these
21. A person deposited a sum of Rs. 10000 in a bank after 2 yr, he withdrew Rs. 4000 and at the end of 5 yr, he received an amount of Rs. 7900; then the rate of simple interest is (a) 6% (b) 5% (c) 10% (d) None
22.  $\int_0^1 \frac{x \cdot e^x}{(x+1)^2} dx$  is equal to (a)  $\frac{e}{2} + 1$  (b)  $\frac{e}{2} - 1$  (c)  $\frac{e^2}{2} - 1$  (d)  $\frac{e^2}{2} + 1$
23. If  $y = x^y$ , then  $\frac{dy}{dx}$  is equal to (a)  $\frac{y^2}{(1-y \log x)}$  (b)  $\frac{y^2}{x(1-y \log x)}$  (c)  $\frac{1}{x(1-y \log x)}$  (d)  $\frac{y}{x(1-y \log x)}$
24. If a, b and c are in GP, then  $\frac{1}{bc}$ ,  $\frac{1}{ca}$  and  $\frac{1}{ba}$  are in (a) AP (b) GP (c) HP (d) HM
25. 20 persons were invited for a party. In how many ways can they and the host be seated at a round table, if there is no restriction? (a) 21! (b) 20! (c) 21! - 1 (d) 20! - 1
26. Dinesh and Hiren are friends. Dinesh borrowed a sum of Rs. 40000 at 5% per annum simple interest from Hiren. He returns with interest after 2 yr. Hiren returns to Dinesh 3% of total amount returned. How much amount Dinesh receives back? (a) 4000 (b) 1320 (c) 2680 (d) None of these
27. If  $a = 3^{1/4} + 3^{-1/4}$  and  $b = 3^{1/4} - 3^{-1/4}$ , then the value of  $3(a^2 + b^2) =$  (a)  $\frac{64}{3}$  (b) 64 (c) -64 (d) None
28. If  $\frac{p}{4} = \frac{q}{5} = \frac{r}{9}$ , then  $\frac{p+q+r}{r}$  is (a) 4 (b) 3 (c) 2 (d) 1
29. The value of  $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots \infty}}}$ , is (a) 1 (b) 2 (c) 3 (d) None
30. What is the value of x, if  $\log_5(x + 12) - \log_5 x = 1$  (a) 3 (b) 2 (c) 1 (d) 0
31. The 6<sup>th</sup> term from the end of the GP, 8, 4, 2, 1, ..., 1/1024 is (a) 1/64 (b) 32 (c) 1/32 (d) none
32. The roots of the equation  $9 \left[ y^2 + \frac{1}{y^2} \right] - 27 \left[ y + \frac{1}{y} \right] + 8 = 0$  are  
 (a)  $-1 \pm \sqrt{2}, \frac{1}{3}$  (b) 3, 1 (c) Either (a) or (b) (d) Neither (a) nor (b)
33. A person aged 45 wishes his wife to have Rs. 40 lakhs at his death. His expected life is upto 75 yr and he starts making equal annual investments commencing now at 3% compound interest per annum, for this his annuity will be Given  $(1 + 0.03)^{30} = 2.42726$  (a) 84250 (b) 84077 (c) 84100 (d) None
34. Find the number of ways in which 12 mangoes may be equally divided among 3 boys?  
 (a) 34650 (b) 36450 (c) 35650 (d) 34560
35. Find the three numbers in GP whose sum is  $(57/2)$  and product is 729 (a) 3, 9, 27 (b) 6, 9,  $\frac{27}{2}$  (c) 4, 8, 16 (d) None
36. In an organization Employer required maximum ten employees. X and Y are numbers of male and female respectively then which inequality shows right relation.  
 (a)  $x+y = 10$  (b)  $x+y \leq 10$  (c)  $x+y \geq 10$  (d)  $x \geq 10$
37. If  $A = \{a, b, c\}$  and  $R = \{(a, a), (a, b), (b, c), (b, b), (c, c), (c, a)\}$  is a relation on A, then which one of the following is correct?  
 (a) R is reflexive, symmetric and transitive (b) R is reflexive and symmetric, but not transitive  
 (c) R is reflexive and transitive, but not symmetric (d) R is reflexive, but neither symmetric nor transitive
38. If  $A = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 0 & -2 \\ 1 & 0 & 3 \end{bmatrix}$  then find adj A  
 (a)  $\begin{bmatrix} 0 & 3 & 2 \\ -11 & 1 & 8 \\ 0 & -1 & 3 \end{bmatrix}$  (b)  $\begin{bmatrix} 0 & 3 & 2 \\ 11 & 1 & 8 \\ 0 & -1 & 3 \end{bmatrix}$  (c)  $\begin{bmatrix} 0 & 11 & 0 \\ 3 & 1 & -1 \\ 2 & 8 & 3 \end{bmatrix}$  (d) None
39. If  $n(A) = 115$ ,  $n(B) = 326$  and  $n(A-B) = 47$  then  $n(A \cup B) = ?$  (a) 373 (b) 165 (c) 370 (d) 394
40. A square is drawn by joining mid-points of the sides of a square. Another square is drawn inside the second square in the same way and the process is continued indefinitely. If the side of the first square is 16 cm, then what is the sum of the areas of all the squares? (a) 341 sq. cm (b) 512 sq. cm (c) 1024 sq. cm (d) 512/3 sq. cm

**PART B – LOGICAL REASONING**

41. 120, 99, ?, 63, 48, 35. (a) 80 (b) 36 (c) 45 (d) 40  
 42. 1, 4, 10, 22, ?, 94 (a) 46 (b) 48 (c) 49 (d) 47  
 43. 1, 1, 4, 8, 9, ?, 16, 64 (a) 27 (b) 28 (c) 32 (d) 40  
 44. 2, 3, 3, 5, 10, 13, 39, ?, 172, 177 (a) 42 (b) 44 (c) 43 (d) 40  
 45. 5, 2, 7, 9, 16, 25, 41, ? (a) 65 (b) 66 (c) 67 (d) 68  
 46. If RED is coded as 6720 then GREEN would be coded as  
 (a) 9207716 (b) 167129 (c) 1677209 (d) 1972091  
 47. If A = 1, FAT = 27, FAITH = ? (a) 44 (b) 45 (c) 46 (d) 36  
 48. If GOLD is written as IQNF, how WIND can be written as code?  
 (a) YKPF (b) VHCM (c) XJOE (d) DNIW

**Directions: Find odd One out of the following (49 - 51):**

49. 4, 5, 7, 10, 14, 18, 25, 32 (a) 7 (b) 14 (c) 18 (d) 33  
 50. 156, 468, 780, 1094, 1404, 1760 (a) 468 (b) 780 (c) 1094 (d) 1716  
 51. 8, 14, 26, 48, 98, 194, 386 (a) 14 (b) 48 (c) 98 (d) 194  
 52. 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  
 53. Five boys A, B, C, D, E, are sitting in a park in a circle. A is facing South-West, D is facing South-East, B and E are right opposite A and D respectively and C is equidistant between D and B. Which direction is C facing?  
 (a) West (b) South (c) North (d) East  
 54. Six persons M, N, O, P, Q and R are sitting in two row with three persons in each row, Both the row are in front of each other. Q is not at the end of any row. P is second the left of R. O is the neighbour of Q and diagonally opposite to P. N is the neighbour of R. Who is in front N? (UPSC (CSAT) 2011)  
 (a) R (b) Q (c) P (d) M  
 55. In a college party, 5 girls are sitting in a row. P is to the left of M and to the right of O. R is sitting to the right of N but to the left of O. Who is sitting in the middle?  
 (a) O (b) R (c) P (d) M

**Question 56:** Seven friends T, U, V, W, X, Y and Z are sitting in a straight line facing north. W sits fifth to the right of T. W does not sit at any of extreme ends. Two people sit between Z and X. Y sits third to the left of U. Y sits exactly in the middle. Z is not an immediate neighbour of Y.

56. What is Z's position with respect to W ?  
 (a) Second to the left (b) Third to the right (c) Fourth to the left (d) Third to the left  
 57. If P is the husband of Q and R is the mother of S and Q. What is R to P ?  
 (a) Mother (b) Sister (c) Aunt (d) Mother-in-law  
 58. X and Y are the children of A. A is the father of X but Y is not his son. How is Y related to A?  
 (a) Sister (b) Brother (c) Son (d) Daughter

**(Question 59 & 60):** Each of the following questions contains two statements followed by conclusions numbered I and II. You have to consider the two statements to be true, even if they to be at variance at the commonly known facts. You have to decide which of the given conclusion definitely follows from the given statements.

Given answer (a) if only I follows; (b) if only conclusion II follows; (c) if either I or II follows; and (d) neither I nor II follows

59. **Statement:** Some Chairs are glasses. All tree are Chairs  
**Conclusions:** I. Some trees are glasses. II. Some glasses are trees.  
 60. **Statement:** No man is a lion. Ram is a man.  
**Conclusions:** I. Ram is not a lion. II. All men are not Ram.

**PART C - STATISTICS**

61. The combined mean of three groups is 12 and the combined mean of first two groups is 3. If the first, second and third groups have 2,3 and 5 items respectively, then the mean of third group is  
 (a) 10 (b) 21 (c) 12 (d) 13
62. A frequency distribution can be presented graphically by a  
 (a) pie diagram (b) histogram (c) line gram (d) all of the above
63. A bag contains 3 red, 5 yellow and 4 green balls. 3 balls are drawn at random. Find the chance that balls drawn contain exactly two green balls  
 (a)  $\frac{12}{55}$  (b)  $\frac{10}{55}$  (c)  $\frac{13}{55}$  (d) None
64. A committee of 4 persons is to be appointed from 3 officers of the production department, 4 officers of the purchase department, two officers of the sales department and 1 Chartered Accountant. Find the chance there must be one from each category  
 (a)  $\frac{4}{35}$  (b)  $\frac{3}{35}$  (c)  $\frac{1}{7}$  (d) None of these
65. Cost of living Index Number(CLI) is expressed in terms of  
 (a)  $\frac{\sum P_n Q_o}{\sum P_o Q_o} \times 100$  (b)  $\frac{\sum P_n Q_n}{\sum P_o Q_o}$  (c)  $\frac{\sum P_o Q_n}{\sum P_n Q_n}$  (d) None
66. Between 1990 and 2000, the price of a commodity increased by 60% while the production decreased by 30%. By what percentage did the value index of production of commodity change in 2000 with respect to its value 1990?  
 (a) 10% (b) 15% (c) 12% (d) None
67. The consumer price index over a certain period increased from 120 to 215 and the wages of worker increased from Rs. 1680 to Rs. 3,000. What is the loss of the worker?  
 (a) 5.58 (b) 6.58 (c) 7.58 (d) None
68. Which is the appropriate measure of dispersion for open-end classification?  
 (a) Range (b) Quartile deviation (c) mean deviation (d) Standard deviation
69. Consider the two regression lines  $3x + 2y = 26$  and  $6x + y = 31$ . Find the mean values of x and y.  
 (a) 4 and 7 (b) 7 and 4 (c) 5 and 6 (d) None of these
70. Consider the two regression lines  $3x + 2y = 26$  and  $6x + y = 31$ . find the correlation coefficient between X and Y.  
 (a) 0.5 (b) -0.5 (c) 0.6 (d) None
71. If  $P(A) = \frac{1}{2}$ ;  $P(B) = \frac{1}{3}$ ; and  $P(A \cap B) = \frac{1}{4}$ , then the value of  $P(A' \cap B')$  is  
 (a)  $\frac{1}{4}$  (b)  $\frac{3}{4}$  (c)  $\frac{2}{5}$  (d) None
72. If X be poisson variates with parameter 1; then find  $P(3 < X < 5)$  (Given  $e^{-1} = 0.36783$ )  
 (a) 0.015326 (b) 0.15326 (c) 0.012326 (d) None
73. Find the variance of binomial distribution with  $n = 10$ ,  $P = 0.3$   
 (a) 2.1 (b) 3 (c) 7 (d) None
74. In series of 5 observations the values of mean and variance are 4.4 and 8.24 respectively. If three observations are 1,2 and 6, then the value of other two observations are  
 (a) 3,2 (b) 4,9 (c) 10,4 (d) None
75. Normal distribution is  
 (a) bi-modal distribution (b) uni-modal distribution (c) Either (a) or (b) (d) Both (a) and (b)
76. When the data is not collected by the researcher but is obtained through another source, it is called  
 (a) Primary data (b) purchased data (c) secondary data (d) None of these
77. When the correlation coefficient  $r = \pm 1$ , then the two regression lines are  
 (a) perpendicular to each other (b) coincide (c) parallel to each other (d) do not exist
78. 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)  $m + \frac{m+L}{2}$  (b)  $L + \frac{m+L}{2}$  (c)  $2m - L$  (d)  $m - 2L$
79. In a binomial distribution with 6 independent trials. The probability of 3 and 4 successes is found to be 0.2457 and 0.0819, respectively. Find the parameters p and q of the binomial distribution  
 (a)  $\frac{2}{13}$ ,  $\frac{1}{13}$  (b)  $\frac{4}{13}$ ,  $\frac{9}{13}$  (c)  $\frac{5}{13}$ ,  $\frac{2}{13}$  (d) None

80. 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
81. The coefficient of regression of Y on X is  $b_{yx} = 1.2$ . If  $U = \frac{X-100}{2}$  and  $V = \frac{Y-200}{3}$ . Find  $b_{vu}$   
 (a) 0.9 (b) 0.8 (c) 0.7 (d) None of these
82. Find 82 percentile from the following data  
 Rs. 82, Rs. 56, Rs. 90, Rs. 50, Rs. 120, Rs. 75, Rs. 75, Rs. 80, Rs. 130, and Rs. 65.  
 (a) Rs. 120.20 (b) Rs. 135.20 (c) Rs. 85.30 (d) Rs. 150.75
83. For a moderately skewed distribution, quartile deviation and the standard deviation are related by:  
 (a) S.D. = (2/3) Q.D (b) S.D. =  $\frac{3}{4}$  Q.D (c) S.D. =  $\frac{4}{3}$  Q.D (d) S.D. =  $\frac{3}{2}$  Q.D.
84. If the median of Find the value of  $\frac{x}{5}, \frac{x}{3}, \frac{x}{6}, \frac{x}{2}, \frac{x}{7}$  and x is 24. Find the value of x.  
 (a) 72 (b) 49 (c) 90 (d) 52
85. A lady travel at a speed of 120km/h and returned at quicker speed. If her average speed of the whole journey is 150km/h, find the speed of return journey (in km/h).  
 (a) 250 (b) 300 (c) 200 (d) None
86. Which measure of dispersion is best for open end classes?  
 (a) Range (b) Quartile deviation (c) Mean deviation (d) Standard deviation
87. Coefficient of Variation if Median = 23, Mode = 29 and Variance = 100 is  
 (a) 10% (b) 50% (c) 20% (d) None of these
88. If the standard deviation of 0, 1, 2, 3... 9 is k, than standard deviation of 10, 11, 12, 13,.... 19 is  
 (a) 10k (b) k+10 (c) k (d)  $k + \sqrt{10}$
89. The standard deviation calculated from a set of 32 observations is 5. If the sum of the observations is 80, what is the sum of the squares of these observations ?  
 (a) 10 (b) 1000 (c) 100 (d) 2000
90. Sum of deviation from mean for any set of observation is -  
 (a) Negative (b) Positive (c) Zero (d) None of these
91. If the correlation coefficient  $r = \pm 1$  for the random variables X and Y, then the lines of regressions of Y on X and Y on Y  
 (a) are perpendicular to each other (b) coincide (c) intersect with acute angle  
 (d) are parallel to each other.
92. If  $b_{yx} = 1.24$ ,  $b_{xy} = 0.36$ ,  $\bar{x} = 5.5$ ,  $\bar{y} = 8.8$ , then regression equation of y on x is given by  
 (a)  $y = 1.24x + 1.98$  (b)  $y = -1.24x + 1.98$  (c)  $x = 0.3y + 2.86$  (d) None of these
93. The two lines of regression are  $2x - 7y + 6 = 0$  and  $7x - 2y + 1 = 0$ . What is the correlation coefficient between x and y?  
 (a) -2/7 (b) 2/7 (c) 4/49 (d) None of these
94. Spearman's correlation co-efficient from 10 pairs of observations was calculated at 0.8. Subsequently, it was discovered that the difference in ranks relating to one pair of items was wrongly taken as 7 instead of 9. Correct the co-efficient of rank correlation.  
 (a) 0.51 (b) 0.61 (c) 0.71 (d) 0.81
95. Laspeyre's index is based on (a) Base Year Quantities (b) Current Year Quantities  
 (c) Average of base and current year Quantity (d) None of these.
96. Regression coefficient are .....  
 (a) dependent of change of origin and of scale. (b) independent of both change of origin and of scale.  
 (c) dependent of change of origin but not of scale. (d) independent of change of origin but not of scale
97. \_\_\_\_\_ is the entire upper part of the table which includes columns and sub-column and unit of measurement.  
 (a) Stub (b) Box-head (c) Body (d) Caption
98. Hidden trend, if any, in the data can be noticed in Textual presentation (b) Tabulation (c) Diagrammatic representation (d) All of these
99. The average of 17 numbers is 45. The average of first 9 of these numbers is 51 and the last 9 of these numbers is 36. Find the 9th number?  
 (a) 5 (b) 14 (c) 18 (d) None of these
100. Damages due to floods, droughts, strikes fires and political disturbances are:  
 (a) Trend (b) Seasonal (c) Irregular (d) Cyclical

◆ ALL THE BEST ◆