MATH ASSIGNMENT NO. 6

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

1. If a : b = 3 : 5, then 3a+5b : 4a+7b = ?

2. If $\log_a \sqrt{3} = \dfrac{1}{6}$, find the value of a:

3. If a : b = 16 : 9, then $\sqrt{\dfrac{a}{b}} + \sqrt{\dfrac{b}{a}} =?$

4. The ratio of number of boys and the number of girls in a school is found to be 15 : 32. How many boys and equal number of girls should be added to bring the ratio to 2 : 3 ?

5. Find the value of x from the following:
   $$\sqrt{(9)}^{-5} \times \sqrt{(3)}^{-7} = \sqrt{(3)}^{-x}$$

6. The rational root of the equation
   $2p^3 - p^2 - 4p + 2 = 0$ is:

7. If $2x^2 - (p + 6)2x + 12p = 0$, then the roots are:

8. Solving equation m + $\sqrt{m} = \dfrac{6}{25}$, the value of m is out to:

9. Solve for x of the Inequalities
   $2 \leq \dfrac{3x - 2}{5} \leq 4$ where x is Natural Number

10. On what sum will the compound interest @ 10% per annum for 4 compounded annually be ₹ 6560.

11. An amount becomes ₹ 5,100.50 in 2 years and ₹ 5,203 in 4 years if compounded annually. Thus, value of P and R are:

12. A certain sum invested @ 4% per annum compounded semi-annually amounts to ₹ 3,60,000 at the end of 1 year. Find the sum:

13. Find the future value of annuity of ₹ 1,000 made quarterly for 7 years at interest rate of 14% p.a.

14. Find the present value of ₹ 10,00,000 to be repaid after 5 years if the interest rate be 9%. P.a.

15. A five-year Annuity Due (advance basis) has periodic cash flow of ₹ 1000 each year. If the interest rate is 8% the future value of this annuity will be

16. A person decides to invest ₹ 5,25,000 per year for the next five years in an annuity which gives 5% per annum compounded annually. What in the Approx future value?

17. Find the compound interest if an amount of ₹ 5,00,000 is deposited in a bank for one year at the rate of 9% per annum compounded semi-annually.

18. ₹ 12,500 is paid every year for 10 years to pay off a loan. What is the loan amount if interest rate be 14% per annum compounded annually?

19. An amount is lent at a nominal rate of 4.5% per annum compounded Monthly. What would be the gain in rupees over when compounded annually?

20. What sum of money will produce ₹ 42,800 as an interest in 3 years and 3 months at 2.5% p.a. simple interest

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

22. A fruity basket contains 9 apples, 8 bananas, and 6 mangoes. How many selection of 4 fruit can be made so that 2 are apples 1 banana and 1 mango

23. Out of 7 boys and 4 girls a team of a debate club to be selected. The number of teams such that each team includes atleast 2 girls and atleast double the boys

24. If $^{n}P_4 = 20 \, ^{n}P_2$ where p denotes the number of permutations n =

25. From a group of 8 men and 4 women, 5 persons are to be selected to form a committee so that atleast 2 men are there in the committee in how many ways can it be done?

26. Three numbers are in G.P. with their Sum 130 and their product 27,000. Find Numbers

27. Two finite sets respectively with x and y number of elements. The total numbers of subsets of the first is 56 more than the total number of subsets of the second. The value of x and y respectively.

28. The number of items in the set A is 40; in the set B is 32; in the set C is 50; in both A and B is 4, in both A and C is 5; in both B and C is 7 in all the sets 2. How many are in only one set?

29. $\int x^5 . e^x$ dx is equal

30. $\int x^x (\log x + 1)$ dx is equal to

31. If y = x (x − 1)(x − 2) then $\frac{d^2 y}{dx^2}$ is:

32. The marginal cost function of a good is $2Q + 6 + \frac{13}{Q}$ where Q is the quantity produced. The Approximate cost at Q = 5 if fixed cost is ₹ 1000

33. Find the missing value in the series 0, 2, 3, 6, 10, 17, 28, ?, 75.

34. Find the missing value in $\frac{3}{8}, \frac{8}{19}, \frac{18}{41}, ?, \frac{78}{173}$

35. Find the odd man out of the following 6, 9, 15, 21, 24, 26, 30.

36. If health is written as IFBMUL, then how will north be written in that code?

37. Find the wrong term in:
G4T, J10R, M2OP, P43N, S90L

38. Find the next term:
105, 138, 111, 101

39. One day, Ram Left home and cycles 10km southward, turned right and cycled 5 km and turned right and cycled 10 km and turned left and cycled 10 km. How many kilometers will he have to cycle to reach his home straight?

40. A man is facing west he turns 45 degrees in the clockwise direction and then another 180 degrees in the same direction and then 270 degrees in the anticlockwise direction. Which direction is he facing now?

41. If you are facing North – east and move 10m forward, turn left and move 7.5m, then you are in which direction from the initial point.

42. A man can walk be having long, medium and short step. He can cover 60 meters by 100 long steps, 100 meters by 200 medium steps and 80 meters by 5000 long steps. Then he turns left and walk be taking 6000 medium

steps. He then turns right and walk by taking 2500 short steps. How far (in meters) is he away from his starting point?

43. Five girls G, H, I, J, K are sitting in a row facing south not necessarily in the same order H is sitting between G and K, I is immediate right to K, J is immediate left to G. Which of the following is true?

44. Eight friends I, J, K, L, M, N, O and P are sitting in a circle facing the centre. J is sitting between O and L; is third to the left of J and second to the right of I; K is sitting between I and O; J & M are not sitting opposite to each other which of the following statement is not correct?

45. Pointing out a Lady Sohil said she is the daughter of woman, who is the mother of the husband of my mother. Who is the lady to Sohil?

46. Vicky introduces John as the son of the only brother of his father's wife How is Vicky related to John?

47. A can said to a lady "your mother's husband's sister is my Aunt. "How is the man related to the lady?

48. Pointing to a lady, A said, "that woman is my nephew's maternal grandmother". How is that women related to A's sister who has no sister who has no sister?

49. Pointing out to a lady, Sahil said, "she is the daughter of the woman who is the mother of the husband of my mother". Who is the lady to Sahil?

50. If the AM and HM of two numbers are 6 and 9 respectively, then GM is

51. When 2 fair dice are thrown what is the probability of getting the sum which is a multiple of 3?

52. When two coins are tossed simultaneously the probability of getting at least one tail?

53. When 3 dice are rolled simultaneously the probability of a number on the third die is greater than the sum of the numbers on two dice

54. If A speaks truth in 75% cases and B tells lies in 40% cases. In what percentage both of them likely to contradict with each other in narrating the same statements

55. For a Poisson distributed variable X, we have $P(X = 7) = 8\ P(X = 9)$, find the mean, SD, C/V and 4th moment of the distribution is:

56. The quartile deviation of a normal distribution with mean 10 and standard deviation 4 is _____

57. If the parameter of Poisson distribution is m and $(Mean + S.D.) = \dfrac{6}{25}$ then find m:

58. In Lespeyre's index number is 110 and Fisher's ideal index number is 109. Then Paasche's index number is

59. Find the value of $\dfrac{3t^{-1}}{t^{-1/3}}$

60. If $\log_a (ab) = x$, then $\log_b (ab)$ is

61. In a certain business A and B received profit is a certain ratio B and C received profits in a certain ratio B and C received profits in the same ratio. If A gets ₹ 1600 and C gets ₹ 2500 then how much does B get?

62. The salaries of A, B and C are in the ratio 2 : 3 : 5. If increments of 15%, 10% and 20% are allowed respectively to their salary, then what will be the ratio of their salaries?

63. The value of P for which the difference the root of equation $x^2 + px + 8 = 0$ is 2

64. If the quadratic equation $x^2 + px + q = 0$ and $x^2 + qx + p = 0$ have a common root then $p + q =$?

65. The value of $3^{2-\log_3 6}$ is

66. In how many ways letters of the word ALZEBRA can be arranged without changing the relative orders of the vowels.

67. A certain sum of money is put at compound interest for 2 years @ 20% pa . It would have earned Rs 482 more had it been put on Semi annually compounding basis , the sum of money is

68. How long it will take Rs 1200 to amount Rs 2,000 @ 5 % converted quarterly at compound interest

69. The code word is consists of three English alphabets followed by 2 digits from 1 to 9. How many such code words can be formed.

70. In how many ways 4 letters can be selected out of the word COLLEGE

71. Six persons A B C D E F are to be made to sit in a circle, In how many ways can it be done if A must always have either B or C on his right B must always have either C or D on his right

72. Find the value of $^{47}C_4 + {}^{\Sigma 50\text{-}j}C_3$ if j lies between 1 and 3

73. A polygon has 44 diagonals then the number of sides are

74. Mr. X invests Rs 10,000 every year for next 10 years starting from today @ 8% pa compute total amount on maturity

75. at what time will Rs 3,90,625 amount to Rs 4,56,976 @ 8% pa if the interest is compounded semi annually

76. Compute the amount of provision to be made every year if Plant costing Rs 30 lacs is to be replaced after 10 years presuming opportunity cost @ 10%

77. Rs 10,00,000 be invested at interest rate of 5% and the interest be added to the principal after every 10 years after how long it will become Rs 20,00,000

78. Two equal sums of money were lent at simple interest @ 11% pa for 31/2 years and 41/2 years respectively if the difference of interest is Rs 41250 the sum lent is

79. A plant costing Rs 49,07,400 is depreciated @ 15% p a on diminishing balance method after how long WDV would be Rs 20,00,000 .

80. An amount becomes double in 9 years after how long it would become 16 times of investment if on simple interest

81. If simple interest on a sum of money @ 6% p a for 7 years is equal to twice the interest on another sum for 9 years @ 5% pa the ratio will be

82. The effective rate of interest if nominal rate is 9.90% pa if compounded monthly is

83. An amount of Rs 90,500 was invested in post office @ 7.50% simple interest but on maturity by mistake the interest was calculated @ 5.70 % and an amount of Rs 9,774 was short paid. Find the maturity period.

84. The present value of an annuity of an amount receivable for next 15 years on advance basis starting from today is

85. In how many ways one or more question out of 7 can be answered if each question has alternatives

86. in a crossword puzzles 20 words are to be guessed of which 8 words have each an alternative solution, the number of possible solutions is

87. In order to pass CA foundation a student is required to pass all the 4 papers in how many ways he can be failed.

88. If $^{13}C_6 + 2^{13}C_5 + {}^{13}C_4 = {}^{15}C_x$ Find the value of x

89. $^{10}P_r = 6,04,800$ AND $^nC_r = 120$ the value of r is

90. out of 10 teachers and 20 students a committee of 2 teachers and 3 students are formed. in how many ways such committee cab formed

91. There are 12 points in a plane out of which 6 are collinear how many straight lines can be formed

92. A boats crew consists of 8 men, 3 of whom can row only on one side and 2 only on the other side, the number of ways crew can be arranged is

93. how many numbers greater than 23,000 can be formed with 1,2,3 4 and 5.

94. In how many ways 6 digit numbers can be formed with 9,5,3,1,7, and 0 if 0 is always on ten place

95. The number of 4 digit numbers formed with the digit 1,1,2,2 3,4 is

96. what is the rank of the word COMMERCE if written in dictionary

97. In how many ways 4 letters can be selected out of the word COMMERCE.
98. The supreme court had given 6:3 decision upholding a lower court, the number of ways it can give a majority decision reversing the lower court is
99. If a 4 digit number is formed with 1, 2, 3, 4, 5, 7 and 9 find probability number will be between 3500 and 7500
100.   In a normally distributed factory with average salary Rs 42,000 and standard deviation Rs 13,000 total 5 employees are selected randomly find probability only one person draw more than Rs 68,000

"BEST of LUCK"