1. In a school, for a class monitor selection, there are 6 candidates, and students need to choose up to 3 monitors. A student can vote for 1 or 2 or 3 candidates. In how many ways a student can vote ?

(A) 41 (B) 42

(C) 43 (D) 44

2. Different words are made with rearrangement of letters of the word "TROPICAL" in a way that the vowels occupy odd places when counted from left. How many such words are there ?

(A) 720 (B) 1440

(C) 2880 (D) 2160

3. The common difference of the arithmetic progression $\frac{1}{3}, \frac{1-3b}{3}, \frac{1-6b}{3}, \ldots$ is _____.

(A) $-b$ (B) b

(C) $-3b$ (D) $3b$

4. If the numbers x, $2x + 2$ and $3x + 3$ are in the geometric progression, then the fourth term of the progression is _____.

(A) 27 (B) -27

(C) 13.5 (D) -13.5

5. Find n if ${}^{n}P_{5} = 20\ {}^{n}P_{3}$.

(A) 7 (B) 8

(C) 9 (D) 10

6. The sum of first two terms of a geometric progression is 14 and its infinite sum i.e. sum up to infinity is 32. What is the common ratio of the progression ?

(A) 0.5 (B) 0.75

(C) 1.25 (D) 0.25

7. For a relation R, aRb represents that a is related to b. If for all a, b, c, aRb and bRc gives that aRc, then the relation is _____.

(A) Reflexive (B) Symmetric

(C) Transitive (D) Asymmetric

8. Let S = {a, b, c, d, e}. The number of non-empty proper subsets of S is _____.

(A) 30 (B) 31

(C) 32 (D) 28

9. If $f(y) = \frac{1}{1+y}$ and $g(y) = \frac{y+1}{y}$, then $fog(y) =$ _____.

(A) $\frac{y}{2y+1}$ (B) $\frac{2y}{1+y}$

(C) $\frac{2y+1}{y}$ (D) $\frac{y+1}{y}$

10. The sum of all natural numbers between 200 and 600 those are divisible by 13 is _____.

(A) 12493 (B) 14493

(C) 16493 (D) 18493

11. Find $\frac{dy}{dx}$ for $x^2y^2 + y = 0$.

(A) $\frac{dy}{dx} = \frac{2y^2x}{2y^2x^2 + 1}$

(B) $\frac{dy}{dx} = \frac{-2y^2x}{2yx^2 + 1}$

(C) $\frac{dy}{dx} = \frac{-2y^2x + 1}{2y^2x^2}$

(D) $\frac{dy}{dx} = \frac{2y^2x - 1}{2y^2x^2}$

12. The cost function of an organization is given as $C(x) = 500 - 5x^2 + \frac{x^3}{3}$, where x denotes the output. Find the level of output at which marginal cost is the minimum.

(A) 5

(B) 4

(C) 10

(D) 6

13. The value of $\int_0^4 \frac{x+3}{x+2}\,dx$ is _____.

(A) $4 - \log_e 6 - \log_e 2$

(B) $4 + \log_e 6 - \log_e 2$

(C) $4 + \log_e 6$

(D) $4 + \log_{10} 6 - \log_{10} 2$

14. The value of $\int_3^4 \frac{2x}{1+x^2}\,dx$ is _____.

(A) $\log \frac{16}{10}$

(B) $\log \frac{17}{10}$

(C) $\log \frac{16}{9}$

(D) $\log \frac{17}{9}$

15. The inverse of the function $f(x) = \frac{2+3x}{x+5}$, by taking $f(x)$ as y, is ____.

(A) $\frac{2+5y}{y+3}$

(B) $\frac{2-5y}{y+3}$

(C) $\frac{2-5y}{y-3}$

(D) $\frac{2+5y}{y-3}$

16. Find the odd one out in the series : 2, 5, 10, 17, 26, 37, 50, 64.

(A) 17 (B) 26

(C) 37 (D) 64

17. If in a certain language, MADRAS is coded as NBESBT. How is DELHI coded in that language ?

(A) EMFIJ (B) EFMIJ

(C) EFMKJ (D) EFJMI

18. In a certain code, GLAMOUR is written as IJCNMWP and MISRULE is written as OGUSSNC, then how will MUSICAL be written in that code ?

(A) OSUJECN (B) OSUHACJ

(C) OSUJACJ (D) OSUJABJ

19. In the following series, one term is wrong. Find out the wrong term.

48, 50, 82, 170, 290

(A) 48 (B) 50

(C) 82 (D) 170

20. Complete the given series : 0, 6, 24, 60, 120, 210, _____.

(A) 240 (B) 290

(C) 336 (D) 504

21. Mr. PQR walked 50 metres towards east, took a right turn and walked 40 metres. Then he took a left turn and walked 30 metres. In which direction is he now from the starting point ?

(A) North-East (B) East

(C) South-East (D) South

22. Starting from point A, PQ walked 40 metres south. She turned left and walked 40 metres. She then turned left and walked 40 metres. She again turned left and walked 60 metres and reached point B. How far and in which direction is the point B from the point A ?

(A) 20 metres West (B) 20 metres East

(C) 30 metres West (D) 10 metres West

23. Two persons, P and Q, start walking from a meeting point towards North. After walking 100 metres, P turns left and Q turns right. P, after walking 50 metres, takes a left turn and walks 150 metres. But Q walks 30 metres, turns to his right and walks 90 metres. What is the shortest distance between P and Q now in metres ?

(A) 80 (B) 90

(C) 100 (D) 110

24. Suresh started walking 4 km west from his office. Then he turned right and walked 2 km. Again he turned right and walked 2 km to reach his house. In which direction is Suresh's house from his office ?

(A) South (B) South-East

(C) North-West (D) East

25. Six persons A, B, C, D, E and F are sitting in a circle facing the centre. A is facing D. C is left of A and right of E. D is between B and E. F is right of A. Which one of the following statements is incorrect ?

(A) F and C are neighbours.

(B) F is between A and B.

(C) F and A are neighbours.

(D) B is left of D.

26. Six persons A, B, C, D, E and F are sitting in two rows with 3 persons in each row facing same side. C is sitting in the middle of first row. B is sitting in the left of C. E is also sitting in the middle. A is sitting in the right of E. F is sitting in the right of C. Who is not sitting at one of the ends of any row ?

(A) A

(B) E

(C) D

(D) F

27. A hunter is chasing a deer, by running 200 metres in east direction, turns to his right, runs 100 metres and turns to his right, runs 90 metres. Turning to his left, he runs 50 metres and then turns to left, runs 120 metres. Finally, he turns to left and runs 60 metres. He finds the deer in front of him at 100 metres. In which direction is the hunter standing with respect to the deer now ?

(A) South

(B) North

(C) East

(D) West

28. Seven persons with names T, B, L, A, P, Z and R are standing in a row, facing East. It is given that T is to the right of R; A is between B and Z, L, who is third to the left of B, is at the end; R is fourth to the right of L. Who is at the immediate right of T ?

(A) Z (B) B

(C) P (D) R

29. Eight friends with names P, Q, R, S, T, U, V and W are sitting on a bench and facing North. U is sitting between S and V; Q is sitting between W and P; T is third to the left of V; W is third left of R; V is sitting at one of the corners. Who is sitting immediate right of W ?

(A) P (B) Q

(C) R (D) T

30. Six people, A, B, C, D, E and F are sitting in a hexagonal shape. All the sides of the hexagon so formed are of same length. A is not adjacent to B or C; D is not adjacent to C or E; B and C are adjacent; F is in the middle of D and C. Which of the following is not a correct neighbour pair ?

(A) A and F (B) D and F

(C) B and E (D) C and F

31. A and B are Brothers. C and D are Sisters. A's son is D's Brother. How is B related to C ?

(A) Father
(B) Brother
(C) Grandfather
(D) Uncle

32. Ms. X told Ms. Y, "The girl I met yesterday at the market was the youngest daughter of the brother-in-law of my friend's mother." How is the girl related to Ms. X's friend ?

(A) Cousin
(B) Daughter
(C) Niece
(D) Aunt

33. There are six members, named as, A, B, C, D, E and F. It is given that E is the brother of A's husband; F is the mother of E; B is the daughter of D and A and is the granddaughter of C. How is C related to E ?

(A) Son
(B) Father
(C) Brother
(D) Grandfather

34. A girl introduced a boy as the son of daughter of the father of her uncle. The boy is girl's

(A) Father
(B) Son
(C) Uncle
(D) Cousin/Brother

35. Sampling method which belongs to the category of Mixed sampling is

(A) Systematic Sampling (B) Simple Random Sampling

(C) Stratified Sampling (D) Multi-stage Sampling

36. Number of students in a college is an example of

(A) An attribute (B) A discrete variable

(C) A continuous variable (D) A constant

37. For manifold classification, this method of presentation of data cannot be recommended :

(A) Textual presentation (B) Tabular presentation

(C) Bar Diagram (D) Pie Chart

38. The most commonly used distribution is _____ in which the maximum frequency is at the central part and the frequency decreases when one moves away from the central part on either the left side or the right side.

(A) Bell-shaped curve (B) U-shaped curve

(C) J-shaped curve (D) Mixed curve

39. It is given that a person named as A is married to B; the person E is a brother of D and the person B is the mother of C whose sister is D. How is D related to A ?

(A) Sister (B) Aunt

(C) Daughter (D) Granddaughter

40. After a singing competition on a live TV show, the winner is selected according to the number of likes each candidate has received on a messaging app. This method of data collection is known as _____ sampling.

(A) Random (B) Probabilistic

(C) Purposive (D) Multi-Stage

41. A bar chart can be drawn for the data having numbers on

(A) Students of various disciplines

(B) Persons of different age groups

(C) Sales of a commodity over a year

(D) Temperature recorded during a month.

42. An investigator collects information on salaries received by 1000 persons. From this collection, the data on women are extracted. Now the data is called _____ data.

(A) Primary (B) Secondary

(C) Census (D) Ordinal

43. Two sales-persons present their numbers of sales per week for a month. An appropriate diagram that can be drawn for this data is _____.

(A) Histogram (B) Pie chart

(C) Ogive (D) Adjacent bar chart

44. Which of the followings is not a basic principle of sample survey ?

(A) Principle of Inertia (B) Principle of Optimization

(C) Principle of Large Numbers (D) Law of Statistical Regularity

45. For a moderate
students the m
respectively. T
(A) 47
(C) 53.1

46. If there are tw
two groups ar
(A) 8.0
(C) 3.8

47. Best measure
does not cha
(A) Quartil
(C) Quartil

48. Coefficient
(A) 28.38
(C) 26.75

49. Calculate th
(A) 2.48
(C) 0.31

50. If X and Y
of Y is
(A) –23
(C) –20

45. For a moderately skewed distribution of marks in English for a group of 145 students the mean marks and median marks were found to be 55.10 and 52.40, respectively. The modal marks are

(A) 47 (B) 42
(C) 53.1 (D) 52.2

46. If there are two groups with 10 and 12 observations and harmonic mean of the two groups are 3 and 5 respectively, then the combined Harmonic mean is

(A) 8.0 (B) 2.0
(C) 3.8 (D) 4.0

47. Best measure of Dispersion for open-end classification is the _____, which does not change with the change of _____.

(A) Quartile Deviation, Scale (B) Standard Deviation, Scale
(C) Quartile Deviation, Origin (D) Standard Deviation, Origin

48. Coefficient of range of 84, 93, 53, 70, 82, 65 is

(A) 28.38 (B) 27.39
(C) 26.75 (D) 29.31

49. Calculate the Harmonic Mean of 1, $\frac{1}{3}$, $\frac{1}{6}$ and $\frac{1}{9}$.

(A) 2.48 (B) 0.21
(C) 0.31 (D) 0.25

50. If X and Y are related by $4X + 3Y + 5 = 0$ and Mean of X is 10, then the Mean of Y is

(A) –23 (B) –15
(C) –20 (D) 23

51. A set contains seven numbers whose average is 12. The average of four greater numbers is 18 and the average of four smaller numbers is 8. Which of the followings is the value of one of the numbers ?

(A) 12 (B) 16
(C) 18 (D) 20

52. If the sum of ten values is 20 and sum of squares of these values is 80, then the standard deviation is _____.

(A) 1 (B) 2
(C) 1/2 (D) 4

53. A data set has first eleven positive multiples of 6. The semi inter-quartile range is _____.

(A) 12 (B) 24
(C) 18 (D) 36

54. The number of tosses of a coin, that are needed so that the probability of getting at least one head is 0.875, is

(A) 2 (B) 3
(C) 4 (D) 5

55. Two-person X and Y appear in an interview for two vacancies for the same post. The probability of X's selection is 1/5 and that of Y's selection is 1/3. The probability that none of them will be selected is

(A) 7/15 (B) 8/15
(C) 9/15 (D) 10/15

56. Find the Coefficient of variation for the following numbers :

7, 5, 9, 3, 6

(A) 33.33 (B) 66.66
(C) 3 (D) 300

57. Some dice with six faces have numbers written from Four to Nine. Two such dice are thrown simultaneously. Find the probability that the sum of numbers on the two dice would be 14 or less.

(A) 11/18 (B) 13/18
(C) 1/6 (D) 2/9

58. Three components A, B and C are manufactured separately and then assembled into a finished product. While producing the three components, it is found that 5 percent of component A, 4 percent of component B and 1 percent of component C are defective. What is the probability that the assembled product is free from defects ?

(A) 0.75 (B) 0.8
(C) 0.85 (D) 0.9

59. Two persons are playing a set of matches. The winner of 4 matches is declared as the winner. Any player has 50% chance to win a match. The probability that the game comes to an end at the fourth match is _____.

(A) 5/8 (B) 4/8
(C) 3/8 (D) 1/8

60. The Mode of binomial distribution B(7,1/3) is

(A) 3 (B) 2
(C) 7/3 (D) 8/3

61. A number is selected at random from the first 50 natural numbers. What is the probability that it would be either a two-digit prime number or a composite number lying between 5 and 40 ?

(A) 0.54 (B) 0.48
(C) 0.64 (D) 0.72

62. If a binomial distribution has n = 20 and p = 0.3, what is its variance ?

(A) 4.2 (B) 5.6

(C) 3.4 (D) 2.9

63. It is given that X has normal distribution with mean zero and standard deviation one. Also given that $P[-2 < X < 2] = 0.95$, $P[-2 < X < -1.5] = 0.045$. Find the probability for $P[0 < X < 1.5]$.

(A) 0.63 (B) 0.53

(C) 0.33 (D) 0.43

64. The probability mass function of a distribution is given below in a tabular form :

x	0	1	2	3	4
$p(x)$	k	$2k + k^2$	3k	$2k + k^2$	k

Where k is a non-negative constant. The median of the distribution is

(A) 3k (B) 2

(C) 2k (D) 3

65. An emergency room receives an average of 3 patients per hour. What is the probability that exactly 2 patients arrive in an hour ?

(Given : $e^0 = 1$, $e^{-1} = 0.367$, $e^{-2} = 0.135$, $e^{-3} = 0.049$, $e^{-4} = 0.018$, $e^{-5} = 0.0067$)

(A) 0.22 (B) 0.3

(C) 0.27 (D) 0.25

66. If two variables move in the same direction i.e. an increase (or decrease) on the part of one variable introduces an increase (or decrease) on the part of the other variable, then the two variables are known to be

(A) Positive correlation (B) Negative correlation
(C) Zero correlation (D) Curvilinear correlation

67. If $m + 3x = 10$ and $2y + 5n = 25$ and regression coefficient of y on x is 0.80, what is the regression coefficient of n on m ?

(A) –0.106 (B) 9.375
(C) 0.106 (D) 0.0106

68. If the regression coefficient b_{yx} is greater than one, then the regression coefficient b_{xy}

(A) cannot be less than one (B) cannot be greater than one
(C) can be equal to one (D) can be equal to zero

69. The sum of squares of the differences between two ranks awarded by two judges on 10 candidates is _____ if the rank correlation coefficient is 0.8.

(A) 44 (B) 55
(C) 66 (D) 33

70. For a group of students, the sum of squares of differences in ranks for Maths and Physics marks are found to be 60, which is 120 times the value of rank correlation coefficient. How many students are there in the group ?

(A) 8 (B) 10
(C) 9 (D) 12

71. If $\Sigma p_0 q_0 = 160.7$ and $\Sigma p_1 q_0 = 178.6$, then the cost of living index is

(A) 111.14 (B) 93.10

(C) 104.71 (D) 105.7

72. Which sampling technique can be used for the construction of Index numbers ?

(A) Systematic sampling (B) Quota sampling

(C) Cluster sampling (D) Random sampling

73. From the year 2015 to 2025, Consumer price index increased from 125 to 196. During this period, salary of the employees as per 7th pay commission recommendations was revised from ₹ 25,000 to ₹ 37,250. In real terms, an employee should get following amount as an additional amount to maintain his previous standard of living :

(A) ₹ 1,965 (B) ₹ 1,950

(C) ₹ 1,945 (D) ₹ 14,200

74. If the consumer price index number is 750, then the purchasing power of one rupee is _____.

(A) 12.5 paise (B) 15 paise

(C) 13.3 paise (D) 16.5 paise

75. Two indices that is current on base and base on current should be reciprocals of each other in

(A) Unit test (B) Time reversal test

(C) Circular test (D) Average weighted test

76. XYZ invested ₹ 1,68,000 in a business. After a few months, MNP joined in the business by investing ₹ 1,12,000 in the business. At the end of year, the total profit was divided between them in the ratio 2 : 1. After how many months, did MNP join the business ?

(A) 3 (B) 2

(C) 4 (D) 9

77. The value of $\log_{\sqrt{a}}\left(\sqrt{a\sqrt{a\sqrt{a\sqrt{a}}}}\right)$ is _____.

(A) $\frac{7}{8}$ (B) $\frac{15}{16}$

(C) $\frac{15}{8}$ (D) $\frac{3}{4}$

78. The ratio $\frac{1}{2}\sqrt{35} : \frac{1}{3}\sqrt{140}$ is equal to the ratio _____.

(A) 4 : 3 (B) 2 : 1

(C) 5 : 4 (D) 3 : 4

79. If α and β are the roots of the equation $x^2 - x - 6 = 0$, then the value of $\alpha^3 + \beta^3 + \alpha^2 + \beta^2 + \alpha + \beta$ is equal to _____.

(A) 35 (B) 29

(C) 31 (D) 33

80. The value of x in $\log_x(4) + \log_x(16) + \log_x(64) = 12$ is _____.

(A) 1 (B) 2

(C) 3 (D) 4

81. If α and β are two roots of the equation $2x^2 - 4x + 3 = 0$, then the equation with the roots $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ is _____.

(A) $x^2 + 4x + 1 = 0$

(B) $x^2 - 4x + 1 = 0$

(C) $x^2 - 4x - 1 = 0$

(D) $x^2 + 4x - 1 = 0$

82. Which of the followings is a solution of the inequality $\frac{5x}{3} \leq \frac{x}{6} - 5$?

(A) $(-\infty, -\frac{10}{3}]$

(B) $(-\infty, -\frac{10}{3})$

(C) $(-\infty, -\frac{8}{3}]$

(D) $(-\infty, -\frac{8}{3})$

83. The number of solutions of $\frac{5-2x}{4} < \frac{x}{8} - 5 > 3 - 2x$ are _____, where x is a real number.

(A) Infinitely many

(B) Only two

(C) Exactly one

(D) No solution

84. The region specified by the inequalities $10x + 29y \geq 40$ and $15x - 4y \leq 25$ includes the point _____.

(A) (1, 1.25)

(B) (3, 2.5)

(C) (2.5, 2.5)

(D) (4, 1.25)

85. The roots of the equation $\left(\frac{x}{x-1}\right)^2 - 5\left(\frac{x}{x-1}\right) + 6 = 0$ are :

(A) $2, \frac{3}{2}$

(B) $3, \frac{1}{2}$

(C) $2, \frac{1}{3}$

(D) $3, \frac{2}{3}$

86. The difference between the compound interest and the simple interest on a certain sum at 12% per annum for 2 years is ₹ 90, when the interest is compounded annually. Then the sum is ₹ _____.

(A) 6,150
(B) 6,050
(C) 6,350
(D) 6,250

87. A machine is depreciated at the rate of 15% on reducing balance. The original cost of the machine was ₹ 2,00,000. In approximately how many years, the value of the machine was ₹ 54,500 ? (Given : $0.85^4 = 0.522$)

(A) 9
(B) 6
(C) 8
(D) 7

88. Mohan invests ₹ 25,000 every year starting from today for next 5 years. Interest rate is 7% per annum compounded annually. The future value of the annuity is ₹ _____. (Given : $(1+0.07)^5 = 1.40255$)

(A) 1,46,768
(B) 1,43,768
(C) 1,45,768
(D) 1,44,768

89. Mr. X borrowed ₹ 6,000 from Mr. Y at 10% per annum simple interest. After two years Mr. X wanted to repay this amount, Mr. Y insisted on paying the amount at compound interest at the same rate compounded annually. How much extra does Mr. X have to pay ?

(A) ₹ 60
(B) ₹ 1,260
(C) ₹ 1,200
(D) ₹ 80

90. The compound interest on ₹ 1,00,000, compounded quarterly, for 9 months at the rate of 4% per annum is ₹ _____.

(A) 3,010.1
(B) 3,030.1
(C) 3,330.1
(D) 3,003.1

91. The compound interest of ₹ 4,900 is ₹ 1661 for 2 years at a certain rate of interest, compounded annually. What is the rate of interest per annum in percentage ?

(A) 19.71 (B) 17.71

(C) 13.71 (D) 15.71

92. If Mr. XYZ is investing ₹ 86,000 in a bank fixed deposit scheme where interest will be payable at 12% per annum, compounded half-yearly, what will be the effective rate of interest in a year ?

(A) 12.36% (B) 12.24%

(C) 12.12% (D) 12.48%

93. Ms. Y invested ₹ 2,00,000 in a mutual fund equity scheme. She redeemed entire investment after 96 months and received ₹ 6,00,000 after redemption. What was the Compound Annual Growth Rate (CAGR) in percentage ? (Given : $1.1472^4 = 1.732$)

(A) 14.72 (B) 15.72

(C) 13.72 (D) 12.72

94. A loan of ₹ 5,000 is lent for three years at the rate of 10% per annum, compounded semi-annually. The future value of the money is ₹ _____. (Given : $1.05^6 = 1.34$)

(A) 6,500 (B) 6,600

(C) 6,700 (D) 6,800

95. If ₹ 2,470 is obtained as an interest in 4 years and 4 months at the rate of 3% per annum simple interest rate in bank deposit, how much amount was deposited in ₹ ?

(A) 17,000 (B) 18,000

(C) 19,000 (D) 20,000

96. Suppose you deposit ₹ 1,000 today, ₹ 2,000 after one year from today and ₹ 3,000 after two years from today, in a deposit that pays 10% per annum, compounded annually. What is the balance in the deposit at the end of two year in ₹ just after deposit of ₹ 3,000 ?

(A) 6,000
(B) 6,410
(C) 6,600
(D) 6,800

97. You are interested in an investment of ₹ 5,000 in a fund that promises ₹ 50 at the end of each year, forever. What is the annual interest rate on this investment ?

(A) 1%
(B) 2%
(C) 1.5%
(D) 2.5%

98. An investment was priced at ₹ 100 per share in year 0, priced at ₹ 150 per share in the end of the first year, and priced ₹ 200 per share in the end of second year. What is the Compound Annual Growth Rate (CAGR) of the investment ?

(A) 21.42%
(B) 31.42%
(C) 41.42%
(D) 51.42%

99. How many different words from the letters of the word MATHEMATICS can be formed so that all the vowels always come together in any word ?

(A) 10080
(B) 120960
(C) 4989600
(D) 20160

100. One person wants to have ₹ 20,000 at the end of six years. Hence, he deposits ₹ _____ (rounded in rupee) in a fund that pays 3% per annum, compounded annually. (Given : $1.03^6 = 1.194$)

(A) 17,000
(B) 17,250
(C) 17,750
(D) 16,750