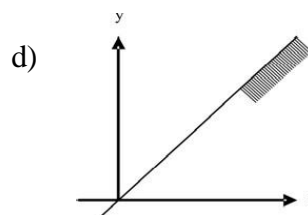**Question No. 1 is compulsory.**
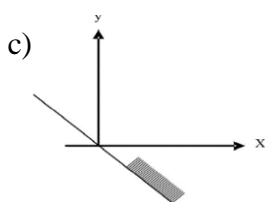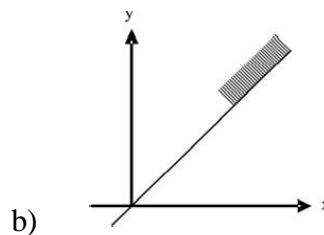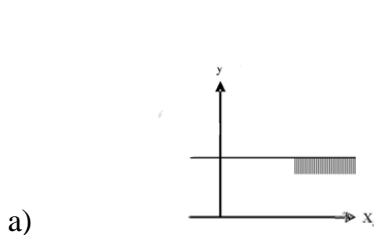**Attempt any four questions from the remaining five questions**.

1. If log 2 = x, log 3 = y. find log (1.20)

   a) 2x + 3y - 1   b) 2x + y - 1   c) x + y + 3   d) None

2. If $a^x = b$, $b^y = c$, $c^z = a$ then find value of $(xyz)^3$

   a) 1   b) 0   c) 8   d) None of these

3. Two vessels containing water and milk in the ratio 2 : 3 and 4 : 5 are mixed in the ratio 1 :2. The ratio of milk and water in the resulting mixture.

   a) 58 : 77   b) 77 : 58   c) 68 : 77   d) None of these

4. A dealer mixes tea costing ` 6.92 per kg. with tea costing ` 7.77 per kg and sells the mixture at ` 8.80 per kg and earns a profit of $17\frac{1}{2}$ % on his sale price. In what proportion does he mix them?

   a) 3:2   b) 2:3   c) 34:51   d) None of these

5. On solving the inequalities $6x + y \geq 18$, $x + 4y \geq 12$, $2x + y \geq 10$, we get the following situation?

   a) (0, 18), (12, 0), (4, 2) and (2, 6)   b) (3, 0), (0, 3), (4, 2) and (7, 6)

   c) (5, 0), (0, 10), (4, 2) and (7, 6)   d) (0, 18), (12, 0), (4, 2), (0, 0) and (7, 6)

6. The graph to express the inequality $y \leq (\frac{1}{2}) x$ is indicated

   a)

   b)

   c)

   d)

7. 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 present age.

a) 7   b) 8   c) 9   d) 6

8. Mr. A Invested ` x in an Organisation it amount to ` 150 at 5% p.a. S.I. and to ` 100 at 3% p.a. S.I. Then the value of x is?

a) 70   b) 40   c) 25   d) None of these

9. Point of intersection of lines $5x + 2y = 90$, $10x + 9y = 180$ lie in _____ Quadrant.

a) 1st b) 2nd c) 3rd d) None of these

10. If slope of line is not defined then that line can be

a) Y-Axis   b) || to Y-Axis   c) | to X-Axis   d) All of these

11. Find the amount of compound interest and effective rate of interest if an amount of ` 20,000 is deposited in a bank for one year at the rate of 8% per annum compounded semi-annually.?

a) 8.18%   b) 7.16%   c) 8.17%   d) 8.16%

12. Z invests ` 10,000 every year starting from today for next 10 years. Suppose interest rate is 8% per annum compounded annually. Calculate future value of the annuity. Given that $(1+ 0.08)^{10}$ = 2.15892500.

a) ` 1,44,665.625             b) ` 1,56,454,875

c) ` 1,56,554,875             d) ` 1,44,865.625

13. The annual birth rate and death rate per 1000 are 39.4 & 19.4 resp. Find number of years population will be doubled?

a) 35 year (approx.)   b) 30 year (approx.)

c) 25 years (approx.)   d) None of these

14. Miss Liza lent ` 4,000 in such a way that some amount was given to Mr. A at 3% p.a. S.I. and rest amount to was given to B at 5% p.a. S.I., the annual interest from both is ` 144, Find the amount lent to Mr. A

a) ` 2,800             b) ` 1,200   c) ` 2,500   d) None

15. 10 years ago, the earning per share (EPS) of ABC Ltd. was ` 5 share its EPS for this year is ` 22. Compute at what rate, EPS of the company grow annually?

a) 15.97%   b) 16.77%   c) 18.64%   d) 14.79%

16. The effective annual rate of interest corresponding to nominal rate 6% p.a.payable quarterly is:

a) 6.14%   b) 6.07%   c) 6.08%   d) 6.09%

17. Johnson left ` 1,00,000 with a direction that it should be divided in such a way that his mirror sons Tom, Dick, Harry aged 9, 12, 15 yrs. should be equally after attaining age of 25 years. The rate of interest is 3.50% p.a.C.I. how much each son will get after getting 25 years old?

    a) ` 50,000          b) ` 51,947   c) ` 52,000   d) None of these

18. A man purchased a house valued at ` 3,00,000. He paid ` 2,00,000 at the time of purchaseand agreed to pay the balance with interest at 12% per annum compounded half yearly in 20 equal half yearly instalments. If the first instalment is paid after six months from the date of purchase then the amount of each instalment is
[Given log 10.6 = 1.0253 and log 31.19 = 1.494]

    a) ` 8,718.45          b) ` 8,769.21   c) ` 7,893.13   d) None of these

19. Find the purchase price of a ` 1000 bond redeemable at the paying annual dividends at 4% if the yield rate is to be 5% effective.

    a) ` 884.16          b) ` 984.17   c) ` 1084.16   d) None of these

20. Alibaba borrows ` 6 lakhs Housing Loan at 6% repayable in 20 annual instalments commencing at the end of the first year. How much annual payment is necessary?

    a) ` 52,420          b) ` 52,419   c) ` 52,310          d) ` 52,320

21. A sinking fund is created for redeeming debentures worth ` 5 lakhs at the end of 25 years. How much provision needs to be made out of profits each year provided sinking fund investments can earn interest at 4% p.a.?

    a) ` 12,006          b) ` 12,040   c) ` 12,039          d) ` 12,035

22. Sinking fund factor is the reciprocal of:
    a) Present value interest factor of a single cash flow
    b) Present value interest factor of an annuity
    c) Future value interest factor of an annuity
    d) Future value interest factor of a single cash flow

23. 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

24. In AP $T_p = q$ and $T_q = p$ then $T_{p+q} = $ _____
    a) 0   b) - (p+q)
    c) (p+q)/2   d) 1

25. Suppose your mom decides to gift you ` 10,000 every year starting from today for the next sixteen years. You deposit this amount in a bank as and when you receive and get 8.5% per annum interest rate compounded annually. What is the present value of this money:
[Given that P (15, 0.085) = 8.304236]

    a) ` 83,042          b) ` 90,100   c) ` 93,042          d) ` 10,100

26. 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

27. Set of cubes of all natural numbers is:

a) Finite set   b) Null set   c) singleton set   d) Infinite set

28. If, in a code, MIND becomes KGLB and ARGUE becomes YPESC, then what will DIAGRAM be in that code?

a) BGYEPYK   b) BGYPYEK   c) GLPEYKB   d) LKBGYPK

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. How many numbers of 3 digits can be made by using digits 3, 5, 6, 7 and 8. No. digit being repeated.

a) 120   b) 60   c) 100   d) None

31. The Total number of numbers less then 1000 and divisible by 5 formed with 0,1, 2, ……9 such that each digit does not occur more than once in each number is

a) 150   b) 152   c) 154   d) None of these

32. If $^{28}C_{2r} : {}^{24}C_{2r-4} = 225:11$ then, then value of r is

a) 7   b) 5   c) 6   d) None of these

33. How many words of 5 consonants & 3 vowels can be formed from 8 consonants & 5 vowels

a) 4,03,200   b) 2,25,79,200   c) 8!   d) None of these

34. A Supreme Court Bench consists of 5 judges. In how many ways, the bench can give a majority decision?

a) 10   b) 5   c) 15   d) 16

35. The first term of an A.P. is 14 and the sums of the first five terms and the first ten terms are equal in magnitude but opposite sign. The 3rd term of A.P. is

a) $6\frac{4}{11}$ b) 6   c) 4/11   d) None of these

36. If A={a, b, c}, B={a, b}, C = {a, b, d}, D={c, d} and E={d} state which of the following statements are correct: - (i) B⊂A (ii) D ≠ C (iii) C⊃ E (iv) D ⊂E (v) D ⊂B (vi) D = A (vii) B⊄C (viii) E⊂A (ix) E⊄ B (x) a ∈A (xi) a⊂A (xii) {a} ∈A (xiii) {a} ⊂A

a) (i) (ii) (iii) (ix) (x) (xiii) only are correct   b) (ii) (iii) (iv) (x) (xii) (xiii) only are correct

c) (i) (ii) (iv) (ix) (xi) (xiii) only are correct   d) None of these

37. The set A = {x: 0 < x < 5 & x ∈ N} represents

    a) {1,2,3,4}   b) {0,1,2,3,4}   c) {1,2,3,4,5}   d) {0,1,2,3,4,5}

38. Find the odd man out from: 64, 32, 512, 243, 1024, 8, 2048

    a) 2048   b) 243   c) 64   d) 8

39. For the curve $x2 + y2 + 2gx + 2hy = 0$, the value of $\frac{dy}{dx}$ at (0, 0) is

    a) -g/h   b) g/h   c) h/g   d) None of these

40. Use integration by parts to evaluate $\int x^2 e^{3x} dx$

    a) $x^2 e^{3x}/3 - 2x\, e^{3x}/9 + 2/27\, e^{3x} + k$ b) $x^2 e^{3x} - 2x\, e^{3x} + 2e^{3x} + k$

    c) $e^{3x}/3 - x\, e^{3x}/9 + 2e^{3x} + k$ d) None of these

41. Ramu's mother said to Ramu: "My mother as a son whose son is Ashwat". How is Ashwat related to Ramu?

    a) Uncle   b) Cousin   c) Brother   d) Nephew

42. 120, 80, 40, 45, ?, 15

    a) 15   b) 20   c) 25   d) 30

43. P, Q, R S and T are seated in a line facing west. R is sitting at north end and S is sitting at south end. T is neighbor of R and Q. P and Q are seated together, then who is sitting the middle?

    a) P   b) Q   c) R   d) S

44. A is father B & C, B is Son of A. But C is not son of A. How is C related to A?

    a) Niece   b) son-in-law   c) Daughter   d) Grandson

45. A box contains ` 56 in the form of coins of one rupee, 50 paise and 25 paise. The number of 50 paise coin is double the number of 25 paise coins and four times the numbers of one-rupee coins. The numbers of 50 paise coins in the box is

    a) 64   b) 32   c) 16   d) 14

46. A, B, C, D, E and F are sitting around a round table. A is between E and F, E is opposite to D, and C is not in either of the neighbouring seats of E. Who is opposite to B?

    a) C   b) D   c) F   d) None of these

47. Pointing to a lady in photograph. Meera said. "Her father's only son's wife is my mother-in-law "How is Meera's husband related to that lady in the photo?

    a) Nephew   b) Uncle   c) Son   d) Father

48. 8, 10, 40, 42, 168, 170, 680, 682, ?

a) 684   b) 1528   c)2728   d) None of these

49. Hari travelled 17 kms to east, he turned left and went 15 kms, he again turned left and went 17 kms. How far he is from starting point?

a) 17 kms   b) 2 kms   c) 15 kms   d) 32 kms

50. A driver left his village and drove North for 20 kms, after which he stopped for breakfast. Then he turned left and drove another 30 kms, 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

51. 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

52. There are Five houses P, Q, R, S, T. P is immediate right of Q and T is immediate left of R and immediate right of P. Q is right of S. Which house in the middle.

a) P   b) Q   c) R   d) T

53. 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

54. 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 1350 and to cover 10 m. In which direction should he go?

a) South   b) South-West   c) South-East   d) North

P to W are sitting in front of one another in two rows. Each row has 4 persons. P is between U and V and facing North. Q, who is immediate left of S is facing W.R is between T and S and W is to the immediate right of V.

Refer above Para for Question **55** & **56**

55. Who is sitting in front of R?

a) U   b) Q   c) V   d) P

56. Who is to the immediate right of R?

a) S   b) U   c) T   d) None of these

57. If X + Y means X is the mother of Y
X – Y means X is the brother of Y;
X % Y means X is the father of Y and
X x Y means X is the sister of Y,
which of the following shows that O is the maternal uncle of L?

a) L – N + M x O   b) O + S x N – L   c) O – M + N x L   d) L – S % O

58. If BROTHER is coded 2456784, SISTER coded as 919684, what is coded for BORBERS?

a) 2542849   b) 2542898   c) 2454889   d) 2524889

59. (i)   F is the brother of A.
(ii)   C is the daughter of A.
(iii) K is the sister of F.
(iv) G is the brother of C.
Who is the uncle of G?

a) A   b) C   c) K   d) F

60. 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) Son   b) Daughter   c) Sister   d) Brother

61. Eight leaders P, Q, R, S, T, U, V and W are sitting on a bench facing towards North

a) T is fourth to the left of P

b) S is fourth to the right of W

c) U and R are not sitting at the ends, but they are neighbours of T and Q respectively.

d) P is next to the right of W and but left of Q.

62. Distribution of profit of company generally follow:

a) J-shaped Curve   b) Bell shaped Curve

c) U- shaped Curve   d) Mixed Curve

63. Out of 1000 persons, 25 percent were industrial workers and the rest were agricultural workers. 300 persons enjoyed world cup matches on TV. 30 per cent of the people who had not watched world cup matches were industrial workers. What is the number of agricultural workers who had enjoyed world cup matches on TV?

a) 260   b) 240   c) 230   d) 250

64. The average of (p+q) consecutive numbers starting from 1 is 'r'. If 's' is added to each of the numbers then the new average will be?

a) r+s   b) r+(s/2)   c) {r + (p+q+s)}/(p+q)   d) None of these

65. If a random sample of size 2 with replacement is taken from the population containing the units 3,6 and 1, then the samples would be

a) (3,6), (3,1), (6,1)

(b) (3,3), (6,6), (1,1)

c) (3,3), (3,6), (3,1), (6,6), (6,3), (6,1), (1,1), (1,3), (1,6)

d) (1,1), (1,3), (1,6), (6, 1), (6,2), (6,3), (6,6), (1,6), (1,1)

66. 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

67. According to Neyman's allocation, in stratified sampling

(a) Sample size is proportional to the population size

(b) Sample size is proportional to the sample SD

(c) Sample size is proportional to the sample variance

(d) Population size is proportional to the sample variance.

68. The mean salary for a group of 40 female workers is `5,200 per month and that for a group of 60 male workers is ` 6800 per month. What is the combined mean salary?

a) 6,167   b) 6,160   c) 6,170   d) 6,177

69. 100 students are classified into male/female and graduate/non-graduate classes. This data classification is

a) Cardinal data   b) Ordinal data

c) Spatial Series data   d) Temporal data

70. Which of the following statements is true?

a) Usually mean is the best measure of central tendency

b) Usually median is the best measure of central tendency

c) Usually mode is the best measure of central tendency

d) Normally GM is the best measure of central tendency

71. Measures of dispersion are used to measure_____

a) Scatterness of data   b) Concentration of data

c) Both of these   d) None of these

72. The number of observations between 150 and 200 based on the following data is:

Value	More than 100	More than 150	More than 200	More than 250
No. of Observations	70	63	28	05

a) 46   b) 35   c) 28   d) 23

73. Data collected on religion from the census reports are:

a) Primary data   b) Secondary data

c) Sample data   d) None of these

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

a) 18   b) 24   c) 22   d) 21

75. Frequency density of a class interval is the ratio of _____

a) Class frequency to total frequency.

b) Class length to class frequency

c) Class frequency to cumulative frequency

d) Frequency of that class interval to the corresponding class length

76. If two variables x and y are related by $2X + 3Y - 7 = 0$ and the mean and mean deviation about mean of X are 1 and 0.3 respectively, then the co-efficient of mean deviation of Y about mean is.

a) -5   b) 4   c) 12   d) 50

77. Ogive for more than type and less than type distributions intersect at

a) Means   b) Median   c) Mode   d) Origin

78. 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^o b) 75° c) 105.6^o d) 94.8^o

79. A shopkeeper wants to place an order for t-shirts with the wholesaler based on past sales data. The size he orders will be decided looking at the of past sales data?

a) Mean   b) Median   c) Mode   d) None of above

80. The weighted mean of first n natural numbers, if their weights are proportional to their corresponding numbers is

a) (2n+3)/3   b) (n-1)/2   c) [(n+1) (2n-1)]/6   d) [3n(n+1)]/2

81. 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

82. An aeroplane flies from A to B at the rate of 500 km/hour and comes back from B to A at the rate of 700 km/ hour. The average speed of the aeroplane.

a) 600 km. per hour

b) 583.33 km. per hour

c) $100 \sqrt{35}$ km. per hour

d) 620 km. per hour.

83. The mean and SD for a group of 100 observations are 65 and 7.03 respectively. If 60 of these observations have mean and SD as 70 and 3 respectively, what is the SD for the group comprising 40 observations?

a) 16   b) 25   c) 4   d) 2

84. What is the coefficient of range for the following distribution?

Class interval:	10-19	20-29	30-39	40-49	50-59
Frequency:	11	25	16	7	3

a) 22   b) 50   c) 72.46   d) 75.82

85. Circular test is satisfied by which of the following index?

a) Laspeyre's index

b) Paasche's index

c) Fisher's index

d) Simple geometric mean of price relatives

86. Assuming that one-third of the population is tea drinkers and each of 1000 enumerators takes a sample of 8 individuals to find out whether they are tea drinkers or not, how many enumerators are expected to report that five or more people are tea drinkers?

a) 100   b) 95   c) 88   d) 90

87. Which of the following distribution is Uni-parametric

a) Binomial's   b) Normal   c) Both a & b   d) Poisson's

88. Rupesh is known to hit a target in 5 out of 9 shots whereas David is known to hit the same target in 6 out of 11 shots. What is the probability that the target would be hit once they both try?

a) 77/99   b) 87/99   c) 77/89   d) None of These

89. $P(\frac{A}{B})$ is defined only when $P(\frac{A}{B'})$ is defined only when

a) B is an impossible event

b) B is not an impossible event

c) B is sure event

d) B is not a sure event

90. In a class 40% students read Mathematics, 25% Biology and 15% both Mathematics and Biology. One student is select at random. The probability that he reads Biology if he reads Mathematics

a) 2/5   b) 3/5   c) 4/5   d) None

91. In a poker set there are 90 chips numbered from 1 to 90. Dan picks 3 chips at random, one after the other, without replacement. What is the probability that the numbers on the chips, in the order that he picks them are in descending order?

a) $\frac{1}{3}$ b) $\frac{1}{30}$ c) $\frac{1}{6}$ d) None of these

92. If Y is dependent variable and X is independent variable and the S.D. of X and Y are 5 and 8 respectively and Co-efficient of co-relation between X and Y is 0.8. Find the Regression coefficient of Y on X:

a) 0.78   b) 1.28   c) 6.8   d) 0.32

93. The standard deviation of a Poison variate is 1.732. What is the probability that the variate lies between -2.3 to 3.68?

a) 0.63   b) 0.67   c) 0.65   d) 0.61

94. If the sum of squares of the rank difference in mathematics and physics marks of 10 students is 22, then the coefficient of rank correlation is:

a) 0.267   b) 0.897   c) 0.92   d) None of these

95. Covariance measures _____ variations of two variables.

a) Joint   b) Single   c) Both   d) None

96. The more scattered the points are around a straight line in a scattered diagram the ___ is the correlation coefficient.

a) Zero   b) More   c) Less   d) None

97. If cov $(x,y) = 50$, $\sigma_x = 10$ then

a) $\sigma_y \geq 5$ b) $\sigma_y < 5$ c) $\sigma_y < 5$ d) Can't say

98. In price index, when a new commodity is required to be added, which of the following index is used?

a) Shifted price index   b) Splicing price index

c) Deflating price index   d) Value price index

99. Chain index is equal today
a) link relative of current year x chain index of the current year / 100

b) link relative of previous year x chain index of the current year / 100

c) link relative of current year x chain index of the previous year / 100

d) link relative of previous year x chain index of the previous year / 100

100. When $P_{01} \times Q_{01}$ = value index number. Which of the following test is satisfied?

    a) Time Reversal Test   b) Factor Reversal Test

    c) Circular Test   d) All of these

————————

100. When $P_{01} \times Q_{01}$ = value index number. Which of the following test is satisfied?

    a) Time Reversal Test   b) Factor Reversal Test

    c) Circular Test   d) All of these