Instructions

1. All questions are of objective type having four answer options for each. Only one option is correct. Correct answer will carry full marks 1. In case of incorrect answer or any combination of more than one answer, ¼ mark will be deducted.

2. Questions must be answered on OMR sheet by darkening the appropriate bubble marked A, B, C, or D.

3. Use only **Black/Blue ball point pen** to mark the answer by complete filling up of the respective bubbles.

4. Mark answers only in the space provided. Do not make any stray mark on the OMR.

5. Write question booklet number and your roll number carefully in the specified locations of the **OMR**. Also fill appropriate bubbles.

6. Write your name (in block letter), name of the examination centre and put your full signature in appropriate boxes in the OMR.

7. The OMR is liable to become invalid if there is any mistake in filling the correct bubbles for question booklet number/roll number or if there is any discrepancy in the name/ signature of the candidate, name of the examination centre. The OMR may also become invalid due to folding or putting stray marks on it or any damage to it. The consequence of such invalidation due to incorrect marking or careless handling by the candidate will be sole responsibility of candidate.

8. Candidates are not allowed to carry any written or printed material, calculator, log-table, wristwatch, any communication device like mobile phones etc. inside the examination hall. Any candidate found with such items will be **reported against** and his/her candidature will be summarily cancelled.

9. Rough work must be done on the question paper itself. Additional blank pages are given in the question paper for rough work.

10. Hand over the OMR to the invigilator before leaving the Examination Hall.

1. In a class, there are 27 boys and 14 girls. The teacher wants to select 1 boy and 1 girl to represent the class for a function. In how many ways can the teacher make this selection?
   A. 378.
   B. 377.
   C. 375.
   D. 379.

2. Find the value of n such that $^nP_5 = 42\ ^nP_3$, n > 4.
   A. 10.
   B. 15.
   C. 12.
   D. 20.

3. P has 2 children. He has a son, Sachin. What is the probability that Sachin's sibling is a brother?
   A. 1/3.
   B. 1/4.
   C. 2/3.
   D. 1/2.

4. If $A = |a_{ij}|_{2\times2}$, where $a_{ij} = i - j$, then A is equal to:
   A. $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$
   B. $\begin{bmatrix} 2 & 3 \\ 3 & 4 \end{bmatrix}$
   C. $\begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}$
   D. $\begin{bmatrix} 1 & 2 \\ 1 & 2 \end{bmatrix}$

5. If A and B are two independent events such that $P(\bar{A}) = 0.75$, $P(A \cup B) = 0.65$ and $P(B) = p$, then find the value of p:
   A. 9/14.
   B. 7/15.
   C. 5/14.
   D. 8/15.

6. In a college, 30% students fail in physics, 25% fail in mathematics and 10% fail in both. One student is chosen at random. The probability that he fails in physics if he has failed in mathematics is:
   A. 1/10.
   B. 1/3.
   C. 9/20.
   D. 2/5.

7. If AB = A and BA = B, then
   A. B = I.
   B. A I.
   C. A^2 A
   D. B^2 I

8. If a matrix A is both symmetric and skew symmetric, then:
   A. A is a diagonal matrix.
   B. A is a zero matrix.
   C. A is a scalar matrix.
   D. A is a square matrix

9. If mean of 3, 4, p, 7, 10 is 6, then the value of p is:
   A. 4.
   B. 5.
   C. 6.
   D. 7.

10. The average weight of 25 boys was calculated to be 78.4 kg. It was later discovered that one weight was misread as 69 kg instead of 96 kg. The correct average is:
    A. 79 kg.
    B. 79.48 kg
    C. 81.32 kg
    D. 80.04 kg

11. The range of data 9, 8, 12, 80, 75, 45, 36, 72 is:
    A. 9.
    B. 80.
    C. 72.
    D. 75.

12. Which one of the following central tendency measure has to be arranged either in ascending or descending order for calculation?
    A. Median.
    B. Arithmetic mean.
    C. Mode.
    D. Geometric mean.

13. There are four balls of different colours and four boxes of colours same as those of the balls. The number of ways in which the balls, one in each box, could be placed such that a ball does not go to box of its own colour is:
    A. 8.
    B. 7.
    C. 9.
    D. 10.

14. Eight coins are thrown simultaneously. Find the probability of getting at least 6 heads?
    A. 31/128.
    B. 37/256.
    C. 37/128.
    D. 31/256.

15. If A is a m X n matrix such that AB and BA are both defined, then B is a
    A. m X n matrix.
    B. n X m matrix.
    C. n X n matrix.
    D. m X m matrix.

16. Each diagonal element of a skew symmetric matrix is
    A. Zero.
    B. Positive.
    C. Non-rea.
    D. Negative.

17. If A^2 A + I - O, then the inverse of A is
    A. I - A.
    B. A - I.
    C. A.
    D. A + I.

18. The arithmetic mean of 9 terms is 15. If one more term is added to this series, then the arithmetic mean becomes 16. The value of the added term is::
    A. 30.
    B. 27.
    C. 25.
    D. 23.

19. A relation between 2 quantities of the same kind(measured in same unit) is called
    A. PROPORTION.
    B. VARIATION.
    C. RATIO.
    D. PROBABILITY.

20. Area of an equilateral triangle with side length a is equal to:
    A. $\sqrt{3}/2a$.
    B. $\sqrt{3}/2a^2$.
    C. $\sqrt{3}/4a^2$.
    D. $\sqrt{3}/4a$.

21. Two concentric circles are of radii 5 cm and 3 cm. The length of the chord of the larger circle which touches the smaller circle is:
    A. 10.
    B. 8.
    C. 12.
    D. 18.

22. If we join two hemispheres of same radius along their bases, then we get a
    A. Cone.
    B. Cylinder.
    C. Sphere.
    D. Cuboid.

23. A number which when divided by 10 leaves remainder of 9, when divided by 9 leaves a remainder of 8, and when divided by 8 leaves a remainder of 7, is
    A. 359.
    B. 1359.
    C. 1539.
    D. 539

24. The average weight of 10 parcels is 1.7 kg. The average weight is reduced by 60 grams when a new parcel is added. How much is the weight of the new parcel?
    A. 1.04.
    B. 1.08.
    C. 1.4.
    D. 1.8.

25. The HCF of two numbers is 14. Their difference is 14. The numbers are
    A. 36, 46.
    B. 58,72.
    C. 64,78.
    D. 98,112.

26. Two numbers are such that the ratio between them is 4:7. If each is increased by 4, the ratio becomes 3:5. The larger number is
    A. 36.
    B. 48.
    C. 56.
    D. 64.

27. A two-digit number is such that the product of the digits is 8. When 18 is added to the number, then the digits are reversed. The number is
    A. 18.
    B. 24.
    C. 42.
    D. 81.

28. If $\log_{10}2 = 0.3010$, then $\log_2{10}$ is equal to
    A. 699/301.
    B. 1000/301.
    C. 0.301.
    D. 0.699.

29. Second Saturday and Every Sunday is a holiday. How many working days will be there in a month of 30 days beginning on a Saturday?
    A. 21.
    B. 22.
    C. 23.
    D. 24.

30. Three times the first of three consecutive odd integers is 3 more than twice the third. The third integer is
    A. 9.
    B. 11.
    C. 13.
    D. 15.

31. If $y=mx+c$ represents the equation of a straight line parallel to x-axis, then
    A. $m=0$, $c=0$.
    B. $m=0$, $c \neq 0$.
    C. $m \neq 0$, $c=0$.
    D. $m \neq 0$, $c \neq 0$.

32. The equation of the straight line $ax+by+c=0$ is reduceable to the form $y=mx+k$, when
    A. $a \neq 0$, $b \neq 0$.
    B. $a \neq 0$.
    C. $b \neq 0$.
    D. $c \neq 0$.

33. Which option about the following statement is correct: "A determenant has got a definite value"
    A. Always.
    B. Sometimes.
    C. Never.
    D. Most of the time.

34. A matrix having equal number of rows and columns is called a
    A. Identity matrix.
    B. Square matrix.
    C. All of these.
    D. None of these.

35. If f(x)=3x-9, state which of the following is the value of f(x^2-1)
  A. $3x^2$-9.
  B. $3x^2$-12.
  C. X^2-10.
  D. $3x^2$-10.

36. Let A and B be two given mutually exclusive events. Then P(A/B) is :
  A. 1.
  B. 0.
  C. 1/2.
  D. Can't be determined.

37. Mode is said to be the
  A. middle most value.
  B. least frequent value.
  C. maximum frequent value.
  D. none of these.

38. The value of the determinant formed by the elements of a Identity matrix is always
  A. 4.
  B. 0.
  C. 1.
  D. A.

39. If A is a square matrix and I is the unit matrix of the same order as A, then A.I = ?
  A. A.
  B. 1.
  C. 0.
  D. 1.

40. The equation of the straight line whose slope is 1 and intercept on x-axis is (-3), is
  A. x-y+3=0.
  B. y-x+3=0.
  C. x+y+3=0.
  D. x+y=3.

41. In Δ ABC, right-angled at B, AB = 24 cm, BC = 7 cm. The value of tan C is:
  A. 12/7.
  B. 24/7.
  C. 20/7.
  D. 7/24.

42. (Sin 30°+cos 60°)-(sin 60° + cos 30°) is equal to:
  A. 0.
  B. $1-2\sqrt{3}$.
  C. $1-\sqrt{3}$.
  D. $1+\sqrt{3}$.

43. In an Arithmetic Progression, if a=28, d=-4, n=7, then an is:
    A. 4.
    B. 5.
    C. 3.
    D. 7.

44. In an Arithmetic Progression, if a=10 and d=10, then the average of first four terms will be:
    A. 15.
    B. 20.
    C. 25.
    D. 30.

45. The sum of two numbers is 27 and product is 182. The numbers are:
    A. 12 and 13.
    B. 13 and 14.
    C. 12 and 15.
    D. 3 and 24.

46. If the length of the shadow of a tree is decreasing then the angle of elevation is:
    A. Remains the same.
    B. Decreasing.
    C. Increasing.
    D. None of the above.

47. An experiment whose outcomes has to be among a set of events that are completely known but whose exact outcomes is unknown is a
    A. Sample spacde.
    B. Elementary event.
    C. Random experiment.
    D. Sure event.

48. D and E are the midpoints of side AB and AC of a triangle ABC, respectively and BC=6cm. If DE || BC, then the length of DE is:
    A. 4.
    B. 3.
    C. 5.
    D. 6.

49. For two or more algebric expressions, the expression of lowest degree which is divisible by each of them without remainder is known as
    A. L.C.M.
    B. H.C.F.
    C. RATIONAL EXPRESSION.
    D. IRRATIONAL EXPRESSION.

50. Find the value of x, if the mode of the following data is 25: (15, 20, 25, 18, 14, 15, 25, 15, 18, 16, 20, 25, 20, x, 18)
    - A. 15.
    - B. 18.
    - C. 20.
    - D. 25.

51. The probability of event equal to zero is called:
    - A. Unsure event.
    - B. Sure Event.
    - C. Impossible event.
    - D. Independent event.

52. Select the wrong statement about probability of an event
    - A. 2/3.
    - B. 1.5.
    - C. 15%.
    - D. 0.7.

53. For some integer n, the odd integer is represented in the form of:
    - A. n.
    - B. n+1.
    - C. 2n+1.
    - D. 2n.

54. Out of 5 men and 3 women, committee of 3 members is to be formed so that it has 1 woman and 2 men. In how many different ways can it be done?
    - A. 20.
    - B. 10.
    - C. 23.
    - D. 30.

55. The volume of a sphere is 4851 cm3. Its diameter is
    - A. 3.5 cm.
    - B. 7 cm.
    - C. 14 cm.
    - D. 21 cm.

56. A fair dice is rolled. Probability of getting a number x such that $1 \leq x \leq 6$, is
    - A. 0.
    - B. > 1.
    - C. between 0 and 1.
    - D. 1.

57. The unit of ratio is
    - A. CM.
    - B. INCHES.
    - C. NO UNIT.
    - D. RADIANS.

58. Product of two expressions / L.C.M =
    A. H.C.F.
    B. L.C.M.
    C. H.C.F. + L.C.M.
    D. H.C.F. X L.C.M.

59. If two quantities are related in such a way that increase in 1 quantity causes increase in other quantity, then this variation is said to be
    A. JOINT VARIATION.
    B. EXTREME VARIATION.
    C. DIRECT VARIATION.
    D. INVERSE VARIATION.

60. The difference between the squares of two consecutive even integers is always divisible by
    A. 3.
    B. 4.
    C. 5.
    D. 6.

61. If x is a prime number, the LCM of x and (x+1) is
    A. x^2.
    B. $(x+1)^2$.
    C. $x(x+1)/2$.
    D. $x(x-1)$.

62. The average of 8 numbers is 21. If each of the number is multiplied by 8, then find the average of new set of numbers.
    A. 168.
    B. 167.
    C. 158.
    D. 161.

63. How many number of arrangement can be formed with the word "CHAIR" if the first place is always held by the letter "C"?
    A. 22.
    B. 24.
    C. 26.
    D. 28.

64. If the length of a rectangle increases by 12% and the breadth increases by 10%, then the % increase in area is
    A. 20%.
    B. 20.2%.
    C. 22%.
    D. 23.2%.

65. In a zoo, there are elephant and peacock. If their heads are counted they are 50 while their legs are 140. Find the number of peacock in the zoo.
    A. 30.
    B. 20.
    C. 40.
    D. 25.

66. (0.9% of 450) : (0.2% of 250) ?
    A. 5.04.
    B. 7.5.
    C. 8.1.
    D. 9.

67. From among 36 teachers in a school, one Principal and one Vice-Principal are to be appointed. In how many ways this can be done?
    A. 1260.
    B. 1250.
    C. 1240.
    D. 1800.

68. If the numbers from 5 to 85 which are exactly divisible by 5 are arranged in descending order, which would come at the 11th place?
    A. 35.
    B. 40.
    C. 50.
    D. 55.

69. Ratio of capital invested by A and B is 4:5 and that of B and C is 3:7. If the total profot is Rs. 6200 and is distributed in proportion to their capital invested, what will be the share of C?
    A. 3100.
    B. 3150.
    C. 4000.
    D. 3500.

70. A candidate scores 25% and fails by 30 marks, while another candidate who scores 50% marks, gets 20 marks more than the minimum required marks to pass the examination. Find the maximum marks for the examination.
    A. 200.
    B. 120.
    C. 300.
    D. 350.

71. What is the greatest number that will divide 29, 60 and 103 and will leave as remainders 5, 12 and 7 respectively?
    A. 24.
    B. 16.
    C. 12.
    D. 14.

72. The sum of the squares of two natural consecutive odd numbers is 394. The sum of the numbers is
    A. 24.
    B. 32.
    C. 40.
    D. 28.

73. If 738A6A is divisible by 11, then the value of A is
    A. 6.
    B. 3.
    C. 9.
    D. 1.

74. In a village the current birth rate per thousand is 55 whereas corresponding death rate is 34 per thousand. The net growth rate in term of population increase will be
    A. 0.021%.
    B. 0.0021%.
    C. 21%.
    D. 2.1%.

75. Half percent, written as a decimal, is
    A. 0.2.
    B. 0.02.
    C. 0.005.
    D. 0.05.

76. The population of a town increases every year by 4%. If its present population is 50,000 then after 2 years, it will be
    A. 53,900.
    B. 54,000.
    C. 54,080.
    D. 54,900.

77. Given $A = 2^{65}$ and $B = (2^{64} + 2^{63} + 2^{62} + \ldots\ldots + 2^{0})$, which of the following is true?
    A. B is larger than A by 10.
    B. A and B are equal.
    C. B is larger than A by 1.
    D. A is larger than B by 1.

78. There are two examination rooms A and B. If 10 students are sent from A to B, then the number of students in each room is the same. If 20 candidates are sent from B to A, then the number of students in A is double the number of students in B.The number of students in room A is
    A. 20.
    B. 80.
    C. 100.
    D. 200.

79. From a pack of 52 cards, two cards are drawn together at random. What is the probability of both the cards being kings?
    A. 1/15.
    B. 25/57.
    C. 35/256.
    D. 1/221.

80. If log 27 = 1.431, then the value of log 9 is
    A. 0.934.
    B. 0.945.
    C. 0.954.
    D. 0.958.

81. If the fifth term of a GP is 81 and first term is 16, what will be the 4th term of the GP?
    A. 36.
    B. 18.
    C. 54.
    D. 24.

82. The sum of first five multiples of 3 is
    A. 45.
    B. 65.
    C. 75.
    D. 90.

83. If $5^a = 3125$, then the value of $5^{(a-3)}$ is
    A. 25.
    B. 125.
    C. 625.
    D. 1625.

84. The value of log2 16 is
    A. 0.125.
    B. 4.
    C. 8.
    D. 16.

85. What is the value of $[\log_{10} (5 \log_{10} 100)]^2$?
    A. 1.
    B. 2.
    C. 10.
    D. 25.

86. The pairs of equations $9x + 3y + 12 = 0$ and $18x + 6y + 26 = 0$ have
    A. Exactly two solutions.
    B. Infinitely many solutions.
    C. Unique solution.
    D. No solution.

87. 30th term of the A.P: 10, 7, 4, ... is
   A. -77.
   B. 77.
   C. -87.
   D. 87.

88. A systematic arrangement of data in rows and columns is
   A. table.
   B. box.
   C. body.
   D. None of these.

89. If the mean of first n natural numbers is 3n/5, then the value of n is:
   A. 3.
   B. 4.
   C. 5.
   D. 6.

90. Two distinct points in a plane determine
   A. An unique line.
   B. Two lines.
   C. An infinite number of lines.
   D. No possible line.

91. Census reports used as a source of data is
   A. Primary source.
   B. Secondary source.
   C. Organized data.
   D. None of these.

92. In volume diagram the three dimensions which are taken into account are:
   A. Length, weight, breadth.
   B. Height, weight, breadth.
   C. Length, height, breadth.
   D. Length, weight, height.

93. The average of first 50 natural numbers
   A. 25.5.
   B. 25.3.
   C. 25.25.
   D. 4.

94. Which one is the not measure of dispersion.
   A. Mean.
   B. S.D.
   C. Range.
   D. Quartile.

95. If $3^6/27 = 3^x$ then the value of 'x' is
    A. 3.
    B. 4.
    C. 5.
    D. 2.

96. Three balls are drawn from a bag containing 2 red and 5 black balls. if the random variable X represents the number of red balls drawn. then X can take values
    A. 0,1,2.
    B. 0,1,2,3.
    C. 2.
    D. 0.

97. In triangle ABC, a = 2, b = 3 and sin A = 2/3, then B is equal to
    A. 30 Degree.
    B. 60 Degree.
    C. 90 Degree.
    D. 120 Degree.

98. If $P(A \cap B) = 70\%$ and $P(B) = 85\%$, then $P(A/B)$ is equal to
    A. 14/17.
    B. 17/20.
    C. 7/8.
    D. 1/8.

99. If A is a square matrix then
    A. A + transpose(A) is symmetric.
    B. A*transpose(A) is skew - symmetric.
    C. transpose(A) + A is skew-symmetric.
    D. transpose(A)*A is skew symmetric.

100. The maximum and minimum values of $\cos^6\theta + \sin^6\theta$ are
    A. 1 and 0.
    B. 1 and 1/4.
    C. 2 and 0.
    D. 1 and ½