(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

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SET-Y

UG-EE-June, 2024
SUBJECT : Statistics (4 Year)

Sr. No. ....10013.....................

Time : 1¼ **Hours**   Max. Marks : **100**   Total Questions : **100**

Roll No. (in figures)_____ (in words) _____

Name _____ Date of Birth_____

Father's Name _____ Mother's Name _____

Date of Examination _____

_____   _____
(Signature of the Candidate)   (Signature of the Invigilator)

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1. *All questions are compulsory.*

2. The candidates *must return* the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.

4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.

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6. *There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.*

7. Use only **Black** or **Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.

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1. How many subsets can be formed from the following set :

   $\{1, 2, 3 …… n\}$

   (1) n

   (2) n^2

   (3) $2n$

   (4) 2^n

2. If $A = \{1, 2, 3\}$, $B = \{3, 4\}$, $C = \{4, 5, 6\}$, then $A \cup (B \cap C)$ is :

   (1) $\{3\}$

   (2) $\{1, 2, 3, 4\}$

   (3) $\{1, 2, 3, 5\}$

   (4) $\{1, 2, 3, 4, 5, 6\}$

3. In rule method, the null set is represented by :

   (1) $\{\ \}$

   (2) ϕ

   (3) $\{x : x = x\}$

   (4) $\{x : x \neq x\}$

4. Let U = $\{1, 2, 3, ….. 10\}$, A = $\{1, 2, 5\}$, B = $\{6, 7\}$, then A $\cap$ B' is (Where A' & B' represent compliment of A and B respectively) :

   (1) A

   (2) B'

   (3) A'

   (4) B

5. In a group of 70 people, 37 like coffee , 52 like tea and each person likes at least one of the two drives. How many like both coffee and tea ?

   (1) 17

   (2) 18

   (3) 19

   (4) 20

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6. The inequality $\frac{2}{x} < 3$ is true, when x belongs to :

(1) $\left[\frac{2}{3}, \infty\right)$

(2) $\left(-\infty, \frac{2}{3}\right]$

(3) $\left(\frac{2}{3}, \infty\right) \cup (-\infty, 0)$

(4) None of these

7. If $A = \{1, 2, 4\}$, then the identity relation on A is :

(1) $\{(1, 1)\}$

(2) $\{(1, 1) (1, 2)\}$

(3) $\{(2, 2), (1, 4)\}$

(4) $\{(1, 1), (2, 2), (4, 4)\}$

8. Let $A = \{x, y, z\}$ and $B = \{1, 2\}$, then the number of relations from A into B are :

(1) 2^5

(2) 2^6

(3) 2^3

(4) 2^2

9. The radian measure corresponding to $-47°30'$ is :

(1) $-\frac{15}{72}\pi$

(2) $\frac{15}{72}\pi$

(3) $-\frac{19}{72}\pi$

(4) $\frac{19}{72}\pi$

10. The value of $\sin\left(\frac{7\pi}{6}\right)$ is :

(1) $-\frac{\sqrt{3}}{2}$

(2) $\frac{1}{2}$

(3) $-\frac{1}{\sqrt{2}}$

(4) $\frac{\sqrt{3}}{2}$

11. The additive inverse of $(2+3i)^2$ is :

 (1) $-5+12i$

 (2) $-9+12i$

 (3) $5-12i$

 (4) $9-12i$

12. Multiplicative inverse of $4+7i$ is :

 (1) $(-4-7i)$

 (2) $-4+7i$

 (3) $-\dfrac{4}{65}+\dfrac{7}{65}i$

 (4) $\dfrac{4}{65}-\dfrac{7}{65}i$

13. How many terms are there in A. P. 20, 22, 24, 26, ..., 100 ?

 (1) 40   (2) 41

 (3) 42   (4) 43

14. The sum of the first 15 terms of the A. P. 5, 10, 15, 20, ... is :

 (1) 400

 (2) 425

 (3) 600

 (4) 525

15. If $\begin{bmatrix} 1 & 0 \\ 3 & -4 \end{bmatrix} + \begin{bmatrix} a & 1 \\ -1 & b \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ 2 & -2 \end{bmatrix}$, then value of a and b are :

 (1) 1, –2

 (2) –1, 2

 (3) –1, –2

 (4) 1, 2

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16. Inverse matrix of $\begin{bmatrix} 2 & -3 \\ -4 & 2 \end{bmatrix}$ is :

(1) $-\dfrac{1}{8}\begin{bmatrix} 2 & 3 \\ 4 & 2 \end{bmatrix}$

(2) $-\dfrac{1}{8}\begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$

(3) $\dfrac{1}{8}\begin{bmatrix} 2 & 3 \\ 4 & 2 \end{bmatrix}$

(4) $\dfrac{1}{8}\begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$

17. The minor of -3 in the determinant $\begin{vmatrix} 2 & -3 & 1 \\ 4 & 0 & 5 \\ -1 & 6 & 7 \end{vmatrix}$ is :

(1) 30

(2) 33

(3) 28

(4) 32

18. Let A be a square matrix of order 3×3, then $|KA|$ is :

(1) $3K\,|A|$

(2) $K\,|A|$

(3) $K^2\,|A|$

(4) $K^3\,|A|$

19. Matrices A and B will be inverse of each other only if :

(1) $AB = BA$

(2) $AB = BA = 0$

(3) $AB = BA = I$

(4) $AB = I, BA = 0$

20. Which of the following is not a property of inverse of a matrix ?

(1) $(A^{-1})^{-1} = A$

(2) $(A^T)^{-1} = (A^{-1})^T$

(3) $(AB)^{-1} = A^{-1}B^{-1}$

(4) $Adj(A^{-1}) = (Adj\,A)^{-1}$

21. For any positive integer n, $\underset{x \to a}{Lim} \dfrac{x^n - a^n}{x - a}$ is :

    (1) 0

    (2) 1

    (3) na^n

    (4) na^{n-1}

22. $\underset{x \to 0}{Lim} \dfrac{\sin 4x}{\sin 2x}$ is equal to :

    (1) 0

    (2) 1

    (3) 2

    (4) 3

23. $\underset{\theta \to \frac{\pi}{2}}{Lim} (\sec \theta - \tan \theta) = ?$

    (1) 0

    (2) 1

    (3) -1

    (4) ∞

24. If $f(x) = x \sin x$, then $f'\left(\dfrac{\pi}{2}\right)$ is :

    (1) 0

    (2) 1

    (3) -1

    (4) $\dfrac{1}{2}$

25. Derivative of e^{x^2} is :

    (1) e^{x^2}

    (2) $2x$

    (3) $2.e^{x^2}$

    (4) $2xe^{x^2}$

26. A function $f(x)$ is not continuous at $x = 1$ if :

(1) $\underset{x \to}{Lim}\, f(x) \neq f(1)$

(2) $\underset{x \to 1}{Lim}\, f(x) = f(1)$

(3) $f^1(1) \neq 0$

(4) None of these

27. If $f(x) = \begin{cases} x + \lambda & ; \quad x < 3 \\ 4 & ; \quad x = 3 \\ 3x - 5 & ; \quad x > 3 \end{cases}$ is continuous at $x = 3,$ then the value of λ is :

(1) 1   (2) -2

(3) -1 (4) 0

28. If f and g be two real functions continuous at a real number 'C', then which one of the following is not true ?

(1) $f + g$ is continuous at $x = c$

(2) $f - g$ is continuous at $x = c$

(3) $f . g$ is continuous at $x = c$

(4) $\dfrac{f}{g}$ is continuous at $x = c$, if $g(0) \neq 0$

29. If $x - y = \pi,$ then $\dfrac{dy}{dx} = ?$

(1) 0   (2) 1

(3) 2   (4) 3

30. If $x = a(t - \sin t)$ and $y = a(1 - \cos t)$ then $\dfrac{dy}{dx} = ?$

(1) $\sec t$ (2) $\operatorname{cosec} t$

(3) $\tan \dfrac{t}{2}$ (4) $\cot \dfrac{t}{2}$

31. If $x = t^2$ and $y = t^3$, then $\dfrac{d^2y}{dx^2} = ?$

    (1) $\dfrac{3}{4t}$

    (2) $\sqrt{t}$

    (3) t

    (4) $\dfrac{3}{2\sqrt{t}}$

32. The rate of change of the area of a circle with respect to its radius $'r'$ where $r = 3$ cm, is :

    (1) 2π

    (2) 4π

    (3) 6π

    (4) 10π

33. The point, at which the tangent to the curve $y = \sqrt{4x-3} - 1$ has its slope $\dfrac{2}{3}$, is :

    (1) $(1, 2)$

    (2) $(2, 1)$

    (3) $(2, 3)$

    (4) $(3, 2)$

34. If $f'(x) = x^2 + 5$ and $f(0) = -1$, then $f(x) = ?$

    (1) $\dfrac{1}{3}x^3 + 5x - 1$

    (2) $\dfrac{1}{3}x^3 + 5x + 1$

    (3) $x^3 + 5x + 1$

    (4) $x^3 + 5x - 1$

35. The value of $\displaystyle\int_{-2}^{2}(px^3 + qx + r)dx$, is :

    (1) r

    (2) $2r$

    (3) $3r$

    (4) $4r$

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36. $\int \dfrac{\sin x + \cos x}{\sqrt{1 + \sin 2x}} dx = ?$

   (1) $\sin x + c$

   (2) $x + c$

   (3) $\cos x + c$

   (4) $x^2 + c$

37. Area bounded by the curve $y = \log x$, x−axis and the ordinates $x = 1$, $x = 2$ is :

   (1) $\log 4$ sq. unit

   (2) $(\log 4 - 1)$ sq. unit

   (3) $(\log 4 + 1)$ sq. unit

   (4) $(\log 4 - 2)$ sq. unit

38. The general solution of $x^2 \dfrac{dy}{dx} = 6$ is :

   (1) $y = \dfrac{-6}{x} + c$

   (2) $y = \dfrac{6}{x} + c$

   (3) $y = \dfrac{12}{x} + c$

   (4) $y = x + c$

39. The order and degree of differential equation $\dfrac{d^4 y}{dx^4} - 4 \dfrac{d^3 y}{dx} + 8 \dfrac{d^2 y}{dx^2} - 8 \dfrac{dy}{dx} + 4y = 0$ are :

   (1) (4, 4)

   (2) (4, 1)

   (3) (1, 1)

   (4) (1, 4)

40. The maximum value of :

   $P = x + 3y$

   Such that :

   $2x + y \le 20$

   $x + 2y \le 20$

   $x \ge 0, y \ge 0$, is :

   (1) 10

   (2) 60

   (3) 30

   (4) 25

41. Which of the following can not be the probability of occurrence of an event ?

(1) $\dfrac{2}{3}$

(2) $\dfrac{3}{2}$

(3) 0

(4) 1

42. In an experiment of rolling a fair die and unbiased coin, the sample space is :

(1) $\{H1, H2, H3, H4, H5, H6\}$

(2) $\{T1, T2, T3, T4, T5, T6\}$

(3) $\{H1, H2, H3, T4, T5, T6\}$

(4) $\{H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6\}$

43. If $P(A) = 0.37$, $P(B) = 0.42$, $P(A \cap B) = 0.09$, then $P(A \cup B)$ is :

(1) 0.7

(2) 0.8

(3) 0.68

(4) 0.75

44. Probability of occurrence of an impossible event is :

(1) 1

(2) 2

(3) 0

(4) 0.5

45. A family has two children. What is the probability that both the children are boys, given that at least one of them is a boy ?

(1) $\dfrac{3}{4}$

(2) $\dfrac{1}{4}$

(3) $\dfrac{1}{2}$

(4) $\dfrac{1}{3}$

46. Given that $P(A) = \dfrac{1}{3}$, $P(B) = \dfrac{3}{4}$ and $P(A \cup B) = \dfrac{11}{12}$, then P(B/A) is :

    (1) $\dfrac{1}{6}$ (2) $\dfrac{5}{6}$

    (3) $\dfrac{2}{9}$ (4) $\dfrac{1}{2}$

47. If $^5P_r = 2 \cdot {^6p_{r-1}}$, then value of 'r' is :

    (1) 1   (2) 2

    (3) 3   (4) 4

48. In how many ways can 5 men and 4 women be seated in a row so that the women occupy the even places ?

    (1) 2880

    (2) 2860

    (3) 2800

    (4) 2820

49. The value of $^nP_{n-1}$ is :

    (1) $n\,!$ (2) n

    (3) $2n\,!$ (4) $2n$

50. The number of squares that can be formed on a Chessboard :

    (1) 224

    (2) 204

    (3) 160

    (4) 64

51. The number of ways 10 digits numbers can be written using the digits 1 and 2 :

    (1) 10_{c_2}

    (2) $10!$

    (3) $10_{c_1} + 9_{c_2}$

    (4) 2^{10}

52. In an experiment of tossing three coins at a time, the probability of getting 2 heads and one tail is :

    (1) $\frac{1}{8}$

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

    (3) $\frac{3}{8}$

    (4) $\frac{1}{2}$

53. If A and B are events such that $P(A/B) = P(B/A)$, then :

    (1) $B \supset A$ but $A \neq B$

    (2) $A = B$

    (3) $A \cap B = \phi$

    (4) $P(B) = P(A)$

54. If A and B are two independent events, then the probability of occurrence of at least one of A and B is given by :

    (1) $P(A) + P(B)$

    (2) $P(A) - P(B)$

    (3) $P(A \cup B)$

    (4) $P(A \cap B)$

55. If A and B are independent events such that $P(A) = \frac{3}{5}$ and $P(B) = \frac{1}{5}$, then $P(A \cap B)$ is :

    (1) $\frac{3}{25}$

    (2) $\frac{4}{5}$

    (3) $\frac{3}{10}$

    (4) $\frac{2}{5}$

56. In context to the Bernoulli trials, which one of the following is not true ?

   (1) There should be a finite number of trials

   (2) The trials should be independent

   (3) Each trial has more than two outcomes

   (4) The probability of success remains the same in each trial

57. Probability can take values :

   (1) 0 to 2

   (2) −2 to 2

   (3) −∞ to 1

   (4) −1 to 1

58. In case of binomial distribution, for given values of 'n' and 'p', the probability of x successes $P(x = x)$ is given by :

   (1) $^{x}c_{n}\, p^{x}\, q^{n-x}$

   (2) $^{n}c_{x}\, p^{x} q^{n-x}$

   (3) $p^{x} \cdot q^{n-x}$

   (4) $^{n}c_{x}\, p^{x}\, q^{n}$

59. If a random variable x follows binomial distribution with 'n' number of trials and 'p' probability of success, then mean of x is :

   (1) p

   (2) $n(1-p)$

   (3) npq

   (4) np

60. The mean and variance of a binomial distribution are 8 and 4 respectively, then $P(x = 1)$ is :

   (1) $\dfrac{1}{2^{4}}$

   (2) $\dfrac{1}{2^{8}}$

   (3) $\dfrac{1}{2^{12}}$

   (4) $\dfrac{1}{2^{6}}$

61. The primary data is gathered through :

(1) Survey   (2) Books

(3) Newspaper   (4) Internet

62. Which of the following is a measure of central tendency ?

(1) Mean deviation

(2) Mean

(3) Quartile deviation

(4) Standard deviation

63. Pie chart represents the components of a factor by :

(1) Angles

(2) Percentages

(3) Sectors

(4) None of these

64. What is the main purpose of statistics ?

(1) To collect data

(2) To analyse data

(3) To interpret data

(4) All of these

65. Which of the following is an example of qualitative data ?

(1) Height

(2) Weight

(3) Age

(4) Gender

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66. Which of the following is a measure of dispersion ?

    (1) Variance

    (2) Median

    (3) Mode

    (4) Mean

67. Which type of data is best represented by a histogram ?

    (1) Categorical

    (2) Discrete

    (3) Continuous

    (4) Nominal

68. If a constant value 5 is subtracted from each observation of a set, then the mean of the set is :

    (1) Increased by 5

    (2) Decreased by 5

    (3) Decreased by 25

    (4) is not affected

69. Geometric mean of two numbers $\frac{1}{16}$ and $\frac{4}{25}$, is :

    (1) $\frac{1}{10}$

    (2) $\frac{1}{100}$

    (3) 10

    (4) 100

70. The standard deviation of the following data is :

    $-1, -2, -3, -4, -5, -6, -7$

    (1) -2

    (2) 4

    (3) 2

    (4) -4

71. The mean of 5 observations 1, 2, 6, x and y is 4.2, then $x + y$ is :

(1) 4

(2) 8

(3) 15

(4) 12

72. Mean deviation for 'n' observations $x_1, x_2, ..., x_n$ from their mean $\overline{X}$ is :

(1) $\dfrac{1}{n} \sum\limits_{i=1}^{n} (X_i - \overline{X})^2$

(2) $\dfrac{1}{n} \sum\limits_{i=1}^{n} |X_i - \overline{X}|$

(3) $\sum\limits_{i=1}^{n} (X_i - \overline{X})^2$

(4) $\sum\limits_{i=1}^{n} |X_i - \overline{X}|$

73. Mean of first 'n' natural number is :

(1) $\dfrac{n}{2}$

(2) $\dfrac{n(n+1)}{2}$

(3) $\dfrac{n+1}{2}$

(4) $\dfrac{n-1}{2}$

74. The standard deviation of 10 observations is 09. If 2 is subtracted from each observation, then the new standard deviation is :

(1) 09

(2) 11

(3) 08

(4) 07

75. Mean deviation from the median for the following data is :

3, 9, 6, 8, 4, 12, 19, 21

(1) 2

(2) 3

(3) 4

(4) 5

76. What is the harmonic mean of 5 and 2 ?

(1) $\dfrac{20}{7}$

(2) $\dfrac{30}{7}$

(3) $\dfrac{10}{7}$

(4) $\dfrac{40}{7}$

77. The sum of deviations about mean is :

(1) Largest

(2) Smallest

(3) Positive

(4) Zero

78. The relationship between arithmetic mean (A. M.), geometric mean (G. M.) and harmonic mean (H. M.) can be expressed as :

(1) A. M. ≥ G. M. ≥ H. M.

(2) A. M. = G. M. – H. M.

(3) G. M. ≥ H. M. ≥ A. M.

(4) A. M. ≤ G. M. ≤ H. M.

79. The range is calculated as :

(1) The sum of all data values

(2) The product of all data values

(3) The square of the mean deviation

(4) The difference between the largest and smallest data values

80. Mode of the following data is :

3, 2, 5, 2, 3, 5, 6, 5, 6, 3, 2, 5, 1

(1) 2

(2) 3

(3) 5

(4) 6

81. A class of 30 boys and 15 girls is given a test in statistics. The average marks obtained by boys is 15 and by girls is 6. The average of whole class is :

    (1) 10.5

    (2) 12

    (3) 12.5

    (4) 10

82. The sum of square of deviations for 10 observations taken from mean is 250. The value of variance is :

    (1) 25

    (2) 30

    (3) 40

    (4) 45

83. The variance of 6, 8, 10, 12, 14 is :

    (1) 1

    (2) 12

    (3) 18

    (4) 8

84. The mean of 8 numbers is 15. A new number 24 is added. The mean of nine numbers is :

    (1) 18

    (2) 16

    (3) 12

    (4) 11

85. The median of the series :

    3, 18, 7, 20, 11, 12, 9, 17, 22

    (1) 11

    (2) 12

    (3) 10

    (4) 8

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86. Find out the missing number of the series :

2, 6, 14, 26, 42, ...

(1) 52

(2) 62

(3) 72

(4) 60

87. Find out the missing letters of the series :

x .... *xx yyx* .... *xyyyxxxx*

(1) *x, x*

(2) *y, y*

(3) *y, x*

(4) *x, y*

88. In a code language if 'TRAINS' is coded as 'RTIASN', how 'PISTOL' will be coded in the same language ?

(1) IPTSLO

(2) IPSTLO

(3) SIPTLO

(4) IPTLSO

89. A person started walking towards North. After walking 30 metres, he turned towards left and walked 40 metres. He then turned left and walked 30 metres. He again turned left and walked 50 metres. How far is he from his original position ?

(1) 40 metres

(2) 30 metres

(3) 20 metres

(4) 10 metres

90. If + means ×, – means +, × means ÷ and ÷ means –, then :

$6 - 3 + 8 \times 3 \div 4 = ?$

(1) 4

(2) 5

(3) 10

(4) 12

91. 'Page' is related to 'Book' as 'Leaf' is related to :

    (1) Root

    (2) Tree

    (3) Fruit

    (4) Forest

92. Newspaper : Press : : Cloth : ?

    (1) Fibre   (2) Textile

    (3) Tailor   (4) Mill

93. In 10 years, 'A' will be twice as old as 'B' was 10 years ago. If at present 'A' is 9 years older than 'B', the present age of 'B' is :

    (1) 19 years

    (2) 29 years

    (3) 39 years

    (4) 59 years

94. Pointing towards a person, a man said to a woman "His mother is the only daughter of your father". How is woman related to that person ?

    (1) Daughter   (2) Mother

    (3) Sister   (4) Wife

95. Mirror image of [→] is :

    (1) [→]

    (2) [←]

    (3) [←]

    (4) [→]

96. Calculate the simple interest of Rs. 7200 at $12\frac{3}{4}\%$ per annum for 9 months :

(1) Rs. 688.50

(2) Rs. 670.50

(3) Rs. 700.1

(4) Rs. 690

97. A man buys 25 chairs for Rs. 375 and sells them at profit equal to the selling price of 5 chairs. What is the selling price of one chair ?

(1) Rs. 14.50

(2) Rs. 15.20

(3) Rs. 17.20

(4) Rs. 18.75

98. A man riding on a bicycle at a speed of 15 km/h crosses a bridge in 5 minute. The length of the bridge is :

(1) 1 km

(2) $1\frac{1}{4}$ km

(3) 2 km

(4) $2\frac{1}{2}$ km

99. The HCF of $\frac{9}{10}, \frac{12}{25}, \frac{18}{25}$ and $\frac{21}{40}$ is :

(1) $\frac{3}{5}$

(2) $\frac{252}{5}$

(3) $\frac{3}{1400}$

(4) $\frac{52}{140}$

100. Find the missing number :

(1) 37

(2) 41

(3) 47

(4) 18

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

B

SET-Y

10038

UG-EE-June, 2024
SUBJECT : Statistics (4 Year)

Sr. No. ....

Time : 1¼ **Hours**   Max. Marks : **100**   Total Questions : **100**

Roll No. (in figures) _____ (in words) _____

Name _____ Date of Birth_____

Father's Name _____ Mother's Name _____

Date of Examination _____

_____   _____
(Signature of the Candidate)   (Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. *All questions are compulsory.*

2. The candidates **must return** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.

4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.

5. The candidate **must not** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers **must not** be ticked in the question booklet.

6. *There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.*

7. Use only **Black** or **Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.

8. *Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained* **30** *minutes after starting of the examination.*

UG-EE-June, 2024/(Statistics-4 Yr.)(SET-Y)/(B)

1. A class of 30 boys and 15 girls is given a test in statistics. The average marks obtained by boys is 15 and by girls is 6. The average of whole class is :

   (1) 10.5

   (2) 12

   (3) 12.5

   (4) 10

2. The sum of square of deviations for 10 observations taken from mean is 250. The value of variance is :

   (1) 25   (2) 30

   (3) 40   (4) 45

3. The variance of 6, 8, 10, 12, 14 is :

   (1) 1

   (2) 12

   (3) 18

   (4) 8

4. The mean of 8 numbers is 15. A new number 24 is added. The mean of nine numbers is :

   (1) 18   (2) 16

   (3) 12   (4) 11

5. The median of the series :

   3, 18, 7, 20, 11, 12, 9, 17, 22

   (1) 11   (2) 12

   (3) 10   (4) 8

6. Find out the missing number of the series :

    2, 6, 14, 26, 42, ...

    (1) 52

    (2) 62

    (3) 72

    (4) 60

7. Find out the missing letters of the series :

    x .... *xx yyx* .... *xyyyxxxx*

    (1) *x, x*

    (2) *y, y*

    (3) *y, x*

    (4) *x, y*

8. In a code language if 'TRAINS' is coded as 'RTIASN', how 'PISTOL' will be coded in the same language ?

    (1) IPTSLO

    (2) IPSTLO

    (3) SIPTLO

    (4) IPTLSO

9. A person started walking towards North. After walking 30 metres, he turned towards left and walked 40 metres. He then turned left and walked 30 metres. He again turned left and walked 50 metres. How far is he from his original position ?

    (1) 40 metres

    (2) 30 metres

    (3) 20 metres

    (4) 10 metres

10. If + means ×, − means +, × means ÷ and ÷ means −, then :

    $6 - 3 + 8 \times 3 \div 4 = ?$

    (1) 4

    (2) 5

    (3) 10

    (4) 12

B

11. The mean of 5 observations 1, 2, 6, x and y is 4.2, then $x + y$ is :

(1) 4

(2) 8

(3) 15

(4) 12

12. Mean deviation for 'n' observations $x_1, x_2, ..., x_n$ from their mean $\overline{X}$ is :

(1) $\dfrac{1}{n} \sum\limits_{i=1}^{n} (X_i - \overline{X})^2$

(2) $\dfrac{1}{n} \sum\limits_{i=1}^{n} |X_i - \overline{X}|$

(3) $\sum\limits_{i=1}^{n} (X_i - \overline{X})^2$

(4) $\sum\limits_{i=1}^{n} |X_i - \overline{X}|$

13. Mean of first 'n' natural number is :

(1) $\dfrac{n}{2}$

(2) $\dfrac{n(n+1)}{2}$

(3) $\dfrac{n+1}{2}$

(4) $\dfrac{n-1}{2}$

14. The standard deviation of 10 observations is 09. If 2 is subtracted from each observation, then the new standard deviation is :

(1) 09

(2) 11

(3) 08

(4) 07

15. Mean deviation from the median for the following data is :

3, 9, 6, 8, 4, 12, 19, 21

(1) 2

(2) 3

(3) 4

(4) 5

4   B

16. What is the harmonic mean of 5 and 2 ?

(1) $\dfrac{20}{7}$ (2) $\dfrac{30}{7}$

(3) $\dfrac{10}{7}$ (4) $\dfrac{40}{7}$

17. The sum of deviations about mean is :

(1) Largest

(2) Smallest

(3) Positive

(4) Zero

18. The relationship between arithmetic mean (A. M.), geometric mean (G. M.) and harmonic mean (H. M.) can be expressed as :

(1) A. M. ≥ G. M. ≥ H. M.

(2) A. M. = G. M. – H. M.

(3) G. M. ≥ H. M. ≥ A. M.

(4) A. M. ≤ G. M. ≤ H. M.

19. The range is calculated as :

(1) The sum of all data values

(2) The product of all data values

(3) The square of the mean deviation

(4) The difference between the largest and smallest data values

20. Mode of the following data is :

3, 2, 5, 2, 3, 5, 6, 5, 6, 3, 2, 5, 1

(1) 2   (2) 3

(3) 5   (4) 6

21. 'Page' is related to 'Book' as 'Leaf' is related to :

    (1) Root

    (2) Tree

    (3) Fruit

    (4) Forest

22. Newspaper : Press : : Cloth : ?

    (1) Fibre   (2) Textile

    (3) Tailor   (4) Mill

23. In 10 years, 'A' will be twice as old as 'B' was 10 years ago. If at present 'A' is 9 years older than 'B', the present age of 'B' is :

    (1) 19 years

    (2) 29 years

    (3) 39 years

    (4) 59 years

24. Pointing towards a person, a man said to a woman "His mother is the only daughter of your father". How is woman related to that person ?

    (1) Daughter   (2) Mother

    (3) Sister   (4) Wife

25. Mirror image of [→] is :

    (1) [→]

    (2) [←]

    (3) [←]

    (4) [→]

B

26. Calculate the simple interest of Rs. 7200 at $12\frac{3}{4}$ % per annum for 9 months :

(1) Rs. 688.50

(2) Rs. 670.50

(3) Rs. 700.1

(4) Rs. 690

27. A man buys 25 chairs for Rs. 375 and sells them at profit equal to the selling price of 5 chairs. What is the selling price of one chair ?

(1) Rs. 14.50

(2) Rs. 15.20

(3) Rs. 17.20

(4) Rs. 18.75

28. A man riding on a bicycle at a speed of 15 km/h crosses a bridge in 5 minute. The length of the bridge is :

(1) 1 km

(2) $1\frac{1}{4}$ km

(3) 2 km

(4) $2\frac{1}{2}$ km

29. The HCF of $\frac{9}{10}, \frac{12}{25}, \frac{18}{25}$ and $\frac{21}{40}$ is :

(1) $\frac{3}{5}$

(2) $\frac{252}{5}$

(3) $\frac{3}{1400}$

(4) $\frac{52}{140}$

30. Find the missing number :

Triangle 1: 5, 2, 13, 3
Triangle 2: 7, 5, ?, 6
Triangle 3: 6, 4, 29, 5

(1) 37

(2) 41

(3) 47

(4) 18

31. How many subsets can be formed from the following set :

    $\{1, 2, 3 \ldots\ldots n\}$

    (1) n

    (2) n^2

    (3) $2n$

    (4) 2^n

32. If $A = \{1, 2, 3\}$, $B = \{3, 4\}$, $C = \{4, 5, 6\}$, then $A \cup (B \cap C)$ is :

    (1) $\{3\}$

    (2) $\{1, 2, 3, 4\}$

    (3) $\{1, 2, 3, 5\}$

    (4) $\{1, 2, 3, 4, 5, 6\}$

33. In rule method, the null set is represented by :

    (1) $\{ \ \}$

    (2) ϕ

    (3) $\{x : x = x\}$

    (4) $\{x : x \neq x\}$

34. Let $U = \{1, 2, 3, \ldots\ldots 10\}$, $A = \{1, 2, 5\}$, $B = \{6, 7\}$, then $A \cap B'$ is (Where A' & B' represent compliment of A and B respectively) :

    (1) A

    (2) B'

    (3) A'

    (4) B

35. In a group of 70 people, 37 like coffee , 52 like tea and each person likes at least one of the two drives. How many like both coffee and tea ?

    (1) 17

    (2) 18

    (3) 19

    (4) 20

36. The inequality $\dfrac{2}{x} < 3$ is true, when x belongs to :

    (1) $\left[\dfrac{2}{3}, \infty\right)$ (2) $\left(-\infty, \dfrac{2}{3}\right]$

    (3) $\left(\dfrac{2}{3}, \infty\right) \cup (-\infty, 0)$ (4) None of these

37. If $A = \{1, 2, 4\}$, then the identity relation on A is :

    (1) $\{(1, 1)\}$

    (2) $\{(1, 1)\,(1, 2)\}$

    (3) $\{(2, 2), (1, 4)\}$

    (4) $\{(1, 1), (2, 2), (4, 4)\}$

38. Let $A = \{x, y, z\}$ and $B = \{1, 2\}$, then the number of relations from A into B are :

    (1) 2^5

    (2) 2^6

    (3) 2^3

    (4) 2^2

39. The radian measure corresponding to $-47°30'$ is :

    (1) $-\dfrac{15}{72}\pi$ (2) $\dfrac{15}{72}\pi$

    (3) $-\dfrac{19}{72}\pi$ (4) $\dfrac{19}{72}\pi$

40. The value of $\sin\left(\dfrac{7\pi}{6}\right)$ is :

    (1) $-\dfrac{\sqrt{3}}{2}$ (2) $\dfrac{1}{2}$

    (3) $-\dfrac{1}{\sqrt{2}}$ (4) $\dfrac{\sqrt{3}}{2}$

41. The number of ways 10 digits numbers can be written using the digits 1 and 2. :

    (1) 10_{C_2}

    (2) $10!$

    (3) $10_{C_1} + 9_{C_2}$

    (4) 2^{10}

42. In an experiment of tossing three coins at a time, the probability of getting 2 heads and one tail is :

    (1) $\dfrac{1}{8}$

    (2) $\dfrac{1}{3}$

    (3) $\dfrac{3}{8}$

    (4) $\dfrac{1}{2}$

43. If A and B are events such that $P(A/B) = P(B/A)$, then :

    (1) $B \supset A$ but $A \neq B$

    (2) $A = B$

    (3) $A \cap B = \phi$

    (4) $P(B) = P(A)$

44. If A and B are two independent events, then the probability of occurrence of at least one of A and B is given by :

    (1) $P(A) + P(B)$

    (2) $P(A) - P(B)$

    (3) $P(A \cup B)$

    (4) $P(A \cap B)$

45. If A and B are independent events such that $P(A) = \dfrac{3}{5}$ and $P(B) = \dfrac{1}{5}$, then $P(A \cap B)$ is :

    (1) $\dfrac{3}{25}$

    (2) $\dfrac{4}{5}$

    (3) $\dfrac{3}{10}$

    (4) $\dfrac{2}{5}$

46. In context to the Bernoulli trials, which one of the following is not true ?

    (1) There should be a finite number of trials

    (2) The trials should be independent

    (3) Each trial has more than two outcomes

    (4) The probability of success remains the same in each trial

47. Probability can take values :

    (1) 0 to 2   (2) -2 to 2

    (3) $-\infty$ to 1   (4) -1 to 1

48. In case of binomial distribution, for given values of 'n' and 'p', the probability of x successes $P(x = x)$ is given by :

    (1) $^{x}c_{n}\, p^{x}\, q^{n-x}$

    (2) $^{n}c_{x}\, p^{x} q^{n-x}$

    (3) $p^{x}.\, q^{n-x}$

    (4) $^{n}c_{x}\, p^{x}\, q^{n}$

49. If a random variable x follows binomial distribution with 'n' number of trials and 'p' probability of success, then mean of x is :

    (1) p (2) $n(1-p)$

    (3) npq (4) np

50. The mean and variance of a binomial distribution are 8 and 4 respectively, then $P(x = 1)$ is :

    (1) $\dfrac{1}{2^{4}}$ (2) $\dfrac{1}{2^{8}}$

    (3) $\dfrac{1}{2^{12}}$ (4) $\dfrac{1}{2^{6}}$

51. The primary data is gathered through :

    (1) Survey   (2) Books

    (3) Newspaper   (4) Internet

52. Which of the following is a measure of central tendency ?

    (1) Mean deviation

    (2) Mean

    (3) Quartile deviation

    (4) Standard deviation

53. Pie chart represents the components of a factor by :

    (1) Angles

    (2) Percentages

    (3) Sectors

    (4) None of these

54. What is the main purpose of statistics ?

    (1) To collect data

    (2) To analyse data

    (3) To interpret data

    (4) All of these

55. Which of the following is an example of qualitative data ?

    (1) Height

    (2) Weight

    (3) Age

    (4) Gender

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56. Which of the following is a measure of dispersion ?

    (1) Variance

    (2) Median

    (3) Mode

    (4) Mean

57. Which type of data is best represented by a histogram ?

    (1) Categorical

    (2) Discrete

    (3) Continuous

    (4) Nominal

58. If a constant value 5 is subtracted from each observation of a set, then the mean of the set is :

    (1) Increased by 5

    (2) Decreased by 5

    (3) Decreased by 25

    (4) is not affected

59. Geometric mean of two numbers $\frac{1}{16}$ and $\frac{4}{25}$, is :

    (1) $\frac{1}{10}$

    (2) $\frac{1}{100}$

    (3) 10

    (4) 100

60. The standard deviation of the following data is :

    $-1, -2, -3, -4, -5, -6, -7$

    (1) -2

    (2) 4

    (3) 2

    (4) -4

61. For any positive integer n, $\underset{x \to a}{Lim} \dfrac{x^n - a^n}{x - a}$ is :

    (1) 0

    (2) 1

    (3) na^n

    (4) na^{n-1}

62. $\underset{x \to 0}{Lim} \dfrac{\sin 4x}{\sin 2x}$ is equal to :

    (1) 0   (2) 1

    (3) 2   (4) 3

63. $\underset{\theta \to \frac{\pi}{2}}{Lim} (\sec \theta - \tan \theta) = ?$

    (1) 0   (2) 1

    (3) −1   (4) ∞

64. If $f(x) = x \sin x$, then $f'\left(\dfrac{\pi}{2}\right)$ is :

    (1) 0

    (2) 1

    (3) −1

    (4) $\dfrac{1}{2}$

65. Derivative of e^{x^2} is :

    (1) e^{x^2}

    (2) $2x$

    (3) $2.e^{x^2}$

    (4) $2x^{e^{x^2}}$

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66. A function $f(x)$ is not continuous at $x = 1$ if :

   (1) $\underset{x \to}{Lim} f(x) \neq f(1)$

   (2) $\underset{x \to 1}{Lim} f(x) = f(1)$

   (3) $f^1(1) \neq 0$

   (4) None of these

67. If $f(x) = \begin{cases} x + \lambda & ; & x < 3 \\ 4 & ; & x = 3 \\ 3x - 5 & ; & x > 3 \end{cases}$ is continuous at $x = 3$, then the value of λ is :

   (1) 1   (2) -2
   (3) -1 (4) 0

68. If f and g be two real functions continuous at a real number 'C', then which one of the following is not true ?

   (1) $f + g$ is continuous at $x = c$

   (2) $f - g$ is continuous at $x = c$

   (3) $f \cdot g$ is continuous at $x = c$

   (4) $\dfrac{f}{g}$ is continuous at $x = c$, if $g(0) \neq 0$

69. If $x - y = \pi$, then $\dfrac{dy}{dx} = ?$

   (1) 0   (2) 1
   (3) 2   (4) 3

70. If $x = a(t - \sin t)$ and $y = a(1 - \cos t)$ then $\dfrac{dy}{dx} = ?$

   (1) $\sec t$ (2) $\operatorname{cosec} t$

   (3) $\tan \dfrac{t}{2}$ (4) $\cot \dfrac{t}{2}$

71. The additive inverse of $(2+3i)^2$ is :

    (1) $-5+12i$

    (2) $-9+12i$

    (3) $5-12i$

    (4) $9-12i$

72. Multiplicative inverse of $4+7i$ is :

    (1) $(-4-7i)$

    (2) $-4+7i$

    (3) $-\dfrac{4}{65}+\dfrac{7}{65}i$

    (4) $\dfrac{4}{65}-\dfrac{7}{65}i$

73. How many terms are there in A. P. 20, 22, 24, 26, ..., 100 ?

    (1) 40   (2) 41

    (3) 42   (4) 43

74. The sum of the first 15 terms of the A. P. 5, 10, 15, 20, ... is :

    (1) 400

    (2) 425

    (3) 600

    (4) 525

75. If $\begin{bmatrix} 1 & 0 \\ 3 & -4 \end{bmatrix}+\begin{bmatrix} a & 1 \\ -1 & b \end{bmatrix}=\begin{bmatrix} 2 & 1 \\ 2 & -2 \end{bmatrix}$, then value of a and b are :

    (1) $1, -2$

    (2) $-1, 2$

    (3) $-1, -2$

    (4) $1, 2$

76. Inverse matrix of $\begin{bmatrix} 2 & -3 \\ -4 & 2 \end{bmatrix}$ is :

(1) $-\dfrac{1}{8}\begin{bmatrix} 2 & 3 \\ 4 & 2 \end{bmatrix}$

(2) $-\dfrac{1}{8}\begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$

(3) $\dfrac{1}{8}\begin{bmatrix} 2 & 3 \\ 4 & 2 \end{bmatrix}$

(4) $\dfrac{1}{8}\begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$

77. The minor of -3 in the determinant $\begin{vmatrix} 2 & -3 & 1 \\ 4 & 0 & 5 \\ -1 & 6 & 7 \end{vmatrix}$ is :

(1) 30

(2) 33

(3) 28

(4) 32

78. Let A be a square matrix of order 3×3, then $|KA|$ is :

(1) $3K\,|A|$

(2) $K\,|A|$

(3) $K^2\,|A|$

(4) $K^3\,|A|$

79. Matrices A and B will be inverse of each other only if :

(1) $AB = BA$

(2) $AB = BA = 0$

(3) $AB = BA = I$

(4) $AB = I,\ BA = 0$

80. Which of the following is not a property of inverse of a matrix ?

(1) $(A^{-1})^{-1} = A$

(2) $(A^T)^{-1} = (A^{-1})^T$

(3) $(AB)^{-1} = A^{-1}.B^{-1}$

(4) $Adj(A^{-1}) = (Adj\ A)^{-1}$

81. Which of the following can not be the probability of occurrence of an event ?

    (1) $\dfrac{2}{3}$

    (2) $\dfrac{3}{2}$

    (3) 0

    (4) 1

82. In an experiment of rolling a fair die and unbiased coin, the sample space is :

    (1) {H1, H2, H3, H4, H5, H6}

    (2) {T1, T2, T3, T4, T5, T6}

    (3) {H1, H2, H3, T4, T5, T6}

    (4) {H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6}

83. If $P(A) = 0.37$, $P(B) = 0.42$, $P(A \cap B) = 0.09$, then $P(A \cup B)$ is :

    (1) 0.7   (2) 0.8

    (3) 0.68   (4) 0.75

84. Probability of occurrence of an impossible event is :

    (1) 1   (2) 2

    (3) 0   (4) 0.5

85. A family has two children. What is the probability that both the children are boys, given that at least one of them is a boy ?

    (1) $\dfrac{3}{4}$

    (2) $\dfrac{1}{4}$

    (3) $\dfrac{1}{2}$

    (4) $\dfrac{1}{3}$

18

86. Given that $P(A) = \dfrac{1}{3}$, $P(B) = \dfrac{3}{4}$ and $P(A \cup B) = \dfrac{11}{12}$, then P(B/A) is :

(1) $\dfrac{1}{6}$

(2) $\dfrac{5}{6}$

(3) $\dfrac{2}{9}$

(4) $\dfrac{1}{2}$

87. If $^5P_r = 2 \cdot {}^6p_{r-1}$, then value of '$r$' is :

(1) 1

(2) 2

(3) 3

(4) 4

88. In how many ways can 5 men and 4 women be seated in a row so that the women occupy the even places ?

(1) 2880

(2) 2860

(3) 2800

(4) 2820

89. The value of $^nP_{n-1}$ is :

(1) n !

(2) n

(3) $2n$!

(4) $2n$

90. The number of squares that can be formed on a Chessboard :

(1) 224

(2) 204

(3) 160

(4) 64

91. If $x = t^2$ and $y = t^3$, then $\dfrac{d^2y}{dx^2} = ?$

(1) $\dfrac{3}{4t}$

(2) $\sqrt{t}$

(3) t

(4) $\dfrac{3}{2\sqrt{t}}$

92. The rate of change of the area of a circle with respect to its radius 'r' where $r = 3$ cm, is :

(1) 2π

(2) 4π

(3) 6π

(4) 10π

93. The point, at which the tangent to the curve $y = \sqrt{4x-3} - 1$ has its slope $\dfrac{2}{3}$, is :

(1) $(1, 2)$

(2) $(2, 1)$

(3) $(2, 3)$

(4) $(3, 2)$

94. If $f'(x) = x^2 + 5$ and $f(0) = -1$, then $f(x) = ?$

(1) $\dfrac{1}{3}x^3 + 5x - 1$

(2) $\dfrac{1}{3}x^3 + 5x + 1$

(3) $x^3 + 5x + 1$

(4) $x^3 + 5x - 1$

95. The value of $\displaystyle\int_{-2}^{2} (px^3 + qx + r)\,dx$, is :

(1) r

(2) $2r$

(3) $3r$

(4) $4r$

20

B

96. $\int \dfrac{\sin x + \cos x}{\sqrt{1 + \sin 2x}}\, dx = ?$

    (1) $\sin x + c$ (2) $x + c$

    (3) $\cos x + c$ (4) $x^2 + c$

97. Area bounded by the curve $y = \log x$, $x-$axis and the ordinates $x = 1$, $x = 2$ is :

    (1) $\log 4$ sq. unit   (2) $(\log 4 - 1)$ sq. unit

    (3) $(\log 4 + 1)$ sq. unit   (4) $(\log 4 - 2)$ sq. unit

98. The general solution of $x^2 \dfrac{dy}{dx} = 6$ is :

    (1) $y = \dfrac{-6}{x} + c$

    (2) $y = \dfrac{6}{x} + c$

    (3) $y = \dfrac{12}{x} + c$

    (4) $y = x + c$

99. The order and degree of differential equation $\dfrac{d^4 y}{dx^4} - 4\dfrac{d^3 y}{dx} + 8\dfrac{d^2 y}{dx^2} - 8\dfrac{dy}{dx} + 4y = 0$ are :

    (1) $(4, 4)$ (2) $(4, 1)$

    (3) $(1, 1)$ (4) $(1, 4)$

100. The maximum value of :

    $P = x + 3y$

    Such that :

    $2x + y \le 20$

    $x + 2y \le 20$

    $x \ge 0$, $y \ge 0$, is :

    (1) 10   (2) 60

    (3) 30   (4) 25

Total No. of Printed Pages : 21

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

$\boxed{\text{C}}$

UG-EE-June, 2024
SUBJECT : Statistics (4 Year)

$\boxed{\text{SET-Y}}$

10039

Sr. No. ....

Time : 1¼ Hours   Max. Marks : **100**   Total Questions : **100**

Roll No. (in figures)_____ (in words) _____

Name _____ Date of Birth_____

Father's Name _____ Mother's Name_____

Date of Examination _____

_____   _____
(Signature of the Candidate)   (Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. *All questions are compulsory.*

2. The candidates *must return* the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.

4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.

5. The candidate *must not* do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers *must not* be ticked in the question booklet.

6. *There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.*

7. Use only **Black** or **Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.

8. *Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained* **30** *minutes after starting of the examination.*

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1. For any positive integer n, $\underset{x \to a}{Lim} \dfrac{x^n - a^n}{x - a}$ is :

   (1) 0

   (2) 1

   (3) na^n

   (4) na^{n-1}

2. $\underset{x \to 0}{Lim} \dfrac{\sin 4x}{\sin 2x}$ is equal to :

   (1) 0   (2) 1

   (3) 2   (4) 3

3. $\underset{\theta \to \frac{\pi}{2}}{Lim} (\sec\theta - \tan\theta) = ?$

   (1) 0   (2) 1

   (3) -1 (4) ∞

4. If $f(x) = x \sin x$, then $f'\left(\dfrac{\pi}{2}\right)$ is :

   (1) 0

   (2) 1

   (3) -1

   (4) $\dfrac{1}{2}$

5. Derivative of e^{x^2} is :

   (1) e^{x^2}

   (2) $2x$

   (3) $2.e^{x^2}$

   (4) $2x^{e^{x^2}}$

6. A function $f(x)$ is not continuous at $x = 1$ if :

   (1) $\underset{x \to}{Lim} f(x) \neq f(1)$

   (2) $\underset{x \to 1}{Lim} f(x) = f(1)$

   (3) $f^1(1) \neq 0$

   (4) None of these

7. If $f(x) = \begin{cases} x + \lambda & ; \quad x < 3 \\ 4 & ; \quad x = 3 \\ 3x - 5 & ; \quad \bar{x} > 3 \end{cases}$ is continuous at $x = 3$, then the value of λ is :

   (1) 1

   (2) -2

   (3) -1

   (4) 0

8. If f and g be two real functions continuous at a real number 'C', then which one of the following is not true ?

   (1) $f + g$ is continuous at $x = c$

   (2) $f - g$ is continuous at $x = c$

   (3) $f.g$ is continuous at $x = c$

   (4) $\dfrac{f}{g}$ is continuous at $x = c$, if $g(0) \neq 0$

9. If $x - y = \pi$, then $\dfrac{dy}{dx} = ?$

   (1) 0

   (2) 1

   (3) 2

   (4) 3

10. If $x = a(t - \sin t)$ and $y = a(1 - \cos t)$ then $\dfrac{dy}{dx} = ?$

    (1) $\sec t$

    (2) $\operatorname{cosec} t$

    (3) $\tan \dfrac{t}{2}$

    (4) $\cot \dfrac{t}{2}$

11. The number of ways 10 digits numbers can be written using the digits 1 and 2 :

(1) 10_{C_2}

(2) $10!$

(3) $10_{C_1} + 9_{C_2}$

(4) 2^{10}

12. In an experiment of tossing three coins at a time, the probability of getting 2 heads and one tail is :

(1) $\frac{1}{8}$

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

(3) $\frac{3}{8}$

(4) $\frac{1}{2}$

13. If A and B are events such that $P(A/B) = P(B/A)$, then :

(1) $B \supset A$ but $A \neq B$

(2) $A = B$

(3) $A \cap B = \phi$

(4) $P(B) = P(A)$

14. If A and B are two independent events, then the probability of occurrence of at least one of A and B is given by :

(1) $P(A) + P(B)$

(2) $P(A) - P(B)$

(3) $P(A \cup B)$

(4) $P(A \cap B)$

15. If A and B are independent events such that $P(A) = \frac{3}{5}$ and $P(B) = \frac{1}{5}$, then $P(A \cap B)$ is :

(1) $\frac{3}{25}$

(2) $\frac{4}{5}$

(3) $\frac{3}{10}$

(4) $\frac{2}{5}$

C

16. In context to the Bernoulli trials, which one of the following is not true ?

(1) There should be a finite number of trials

(2) The trials should be independent

(3) Each trial has more than two outcomes

(4) The probability of success remains the same in each trial

17. Probability can take values :

(1) 0 to 2

(2) −2 to 2

(3) −∞ to 1

(4) −1 to 1

18. In case of binomial distribution, for given values of 'n' and 'p', the probability of x successes $P(x = x)$ is given by :

(1) $^x c_n \, p^x \, q^{n-x}$

(2) $^n c_x \, p^x q^{n-x}$

(3) $p^x \cdot q^{n-x}$

(4) $^n c_x \, p^x \, q^n$

19. If a random variable x follows binomial distribution with 'n' number of trials and 'p' probability of success, then mean of x is :

(1) p

(2) $n(1-p)$

(3) npq

(4) np

20. The mean and variance of a binomial distribution are 8 and 4 respectively, then $P(x=1)$ is :

(1) $\dfrac{1}{2^4}$

(2) $\dfrac{1}{2^8}$

(3) $\dfrac{1}{2^{12}}$

(4) $\dfrac{1}{2^6}$

21. A class of 30 boys and 15 girls is given a test in statistics. The average marks obtained by boys is 15 and by girls is 6. The average of whole class is :

    (1) 10.5

    (2) 12

    (3) 12.5

    (4) 10

22. The sum of square of deviations for 10 observations taken from mean is 250. The value of variance is :

    (1) 25

    (2) 30

    (3) 40

    (4) 45

23. The variance of 6, 8, 10, 12, 14 is :

    (1) 1

    (2) 12

    (3) 18

    (4) 8

24. The mean of 8 numbers is 15. A new number 24 is added. The mean of nine numbers is :

    (1) 18

    (2) 16

    (3) 12

    (4) 11

25. The median of the series :

    3, 18, 7, 20, 11, 12, 9, 17, 22

    (1) 11

    (2) 12

    (3) 10

    (4) 8

26. Find out the missing number of the series :

2, 6, 14, 26, 42, ……………

(1) 52   (2) 62

(3) 72   (4) 60

27. Find out the missing letters of the series :

x …….. *xx yyx* …….. *xyyyxxxx*

(1) *x, x*   (2) *y, y*

(3) *y, x*   (4) *x, y*

28. In a code language if 'TRAINS' is coded as 'RTIASN', how 'PISTOL' will be coded in the same language ?

(1) IPTSLO   (2) IPSTLO

(3) SIPTLO   (4) IPTLSO

29. A person started walking towards North. After walking 30 metres, he turned towards left and walked 40 metres. He then turned left and walked 30 metres. He again turned left and walked 50 metres. How far is he from his original position ?

(1) 40 metres   (2) 30 metres

(3) 20 metres   (4) 10 metres

30. If + means ×, − means +, × means ÷ and ÷ means −, then :

$6 - 3 + 8 \times 3 \div 4 = ?$

(1) 4   (2) 5

(3) 10   (4) 12

31. The mean of 5 observations 1, 2, 6, x and y is 4.2, then $x + y$ is :

(1) 4

(2) 8

(3) 15

(4) 12

32. Mean deviation for 'n' observations $x_1, x_2, ..., x_n$ from their mean $\overline{X}$ is :

(1) $\dfrac{1}{n} \sum\limits_{i=1}^{n} (X_i - \overline{X})^2$

(2) $\dfrac{1}{n} \sum\limits_{i=1}^{n} |X_i - \overline{X}|$

(3) $\sum\limits_{i=1}^{n} (X_i - \overline{X})^2$

(4) $\sum\limits_{i=1}^{n} |X_i - \overline{X}|$

33. Mean of first 'n' natural number is :

(1) $\dfrac{n}{2}$

(2) $\dfrac{n(n+1)}{2}$

(3) $\dfrac{n+1}{2}$

(4) $\dfrac{n-1}{2}$

34. The standard deviation of 10 observations is 09. If 2 is subtracted from each observation, then the new standard deviation is :

(1) 09

(2) 11

(3) 08

(4) 07

35. Mean deviation from the median for the following data is :

3, 9, 6, 8, 4, 12, 19, 21

(1) 2

(2) 3

(3) 4

(4) 5

8

36. What is the harmonic mean of 5 and 2 ?

(1) $\dfrac{20}{7}$

(2) $\dfrac{30}{7}$

(3) $\dfrac{10}{7}$

(4) $\dfrac{40}{7}$

37. The sum of deviations about mean is :

(1) Largest

(2) Smallest

(3) Positive

(4) Zero

38. The relationship between arithmetic mean (A. M.), geometric mean (G. M.) and harmonic mean (H. M.) can be expressed as :

(1) A. M. ≥ G. M. ≥ H. M.

(2) A. M. = G. M. – H. M.

(3) G. M. ≥ H. M. ≥ A. M.

(4) A. M. ≤ G. M. ≤ H. M.

39. The range is calculated as :

(1) The sum of all data values

(2) The product of all data values

(3) The square of the mean deviation

(4) The difference between the largest and smallest data values

40. Mode of the following data is :

3, 2, 5, 2, 3, 5, 6, 5, 6, 3, 2, 5, 1

(1) 2

(2) 3

(3) 5

(4) 6

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41. The additive inverse of $(2 + 3i)^2$ is :

    (1) $-5 + 12i$

    (2) $-9 + 12i$

    (3) $5 - 12i$

    (4) $9 - 12i$

42. Multiplicative inverse of $4 + 7i$ is :

    (1) $(-4 - 7i)$

    (2) $-4 + 7i$

    (3) $-\dfrac{4}{65} + \dfrac{7}{65}i$

    (4) $\dfrac{4}{65} - \dfrac{7}{65}i$

43. How many terms are there in A. P. 20, 22, 24, 26, ..., 100 ?

    (1) 40   (2) 41

    (3) 42   (4) 43

44. The sum of the first 15 terms of the A. P. 5, 10, 15, 20, ... is :

    (1) 400

    (2) 425

    (3) 600

    (4) 525

45. If $\begin{bmatrix} 1 & 0 \\ 3 & -4 \end{bmatrix} + \begin{bmatrix} a & 1 \\ -1 & b \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ 2 & -2 \end{bmatrix}$, then value of a and b are :

    (1) $1, -2$

    (2) $-1, 2$

    (3) $-1, -2$

    (4) $1, 2$

C

46. Inverse matrix of $\begin{bmatrix} 2 & -3 \\ -4 & 2 \end{bmatrix}$ is :

(1) $-\dfrac{1}{8}\begin{bmatrix} 2 & 3 \\ 4 & 2 \end{bmatrix}$

(2) $-\dfrac{1}{8}\begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$

(3) $\dfrac{1}{8}\begin{bmatrix} 2 & 3 \\ 4 & 2 \end{bmatrix}$

(4) $\dfrac{1}{8}\begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$

47. The minor of –3 in the determinant $\begin{vmatrix} 2 & -3 & 1 \\ 4 & 0 & 5 \\ -1 & 6 & 7 \end{vmatrix}$ is :

(1) 30

(2) 33

(3) 28

(4) 32

48. Let A be a square matrix of order 3×3, then |KA| is :

(1) $3K\,|A|$

(2) $K\,|A|$

(3) $K^2\,|A|$

(4) $K^3\,|A|$

49. Matrices A and B will be inverse of each other only if :

(1) $AB = BA$

(2) $AB = BA = 0$

(3) $AB = BA = I$

(4) $AB = I,\ BA = 0$

50. Which of the following is not a property of inverse of a matrix ?

(1) $(A^{-1})^{-1} = A$

(2) $(A^T)^{-1} = (A^{-1})^T$

(3) $(AB)^{-1} = A^{-1}B^{-1}$

(4) $Adj(A^{-1}) = (Adj\ A)^{-1}$

C

51. If $x = t^2$ and $y = t^3$, then $\dfrac{d^2y}{dx^2} = ?$

(1) $\dfrac{3}{4t}$

(2) $\sqrt{t}$

(3) t

(4) $\dfrac{3}{2\sqrt{t}}$

52. The rate of change of the area of a circle with respect to its radius $'r'$ where $r = 3$ cm, is :

(1) 2π

(2) 4π

(3) 6π

(4) 10π

53. The point, at which the tangent to the curve $y = \sqrt{4x-3} - 1$ has its slope $\dfrac{2}{3}$, is :

(1) $(1, 2)$

(2) $(2, 1)$

(3) $(2, 3)$

(4) $(3, 2)$

54. If $f'(x) = x^2 + 5$ and $f(0) = -1$, then $f(x) = ?$

(1) $\dfrac{1}{3}x^3 + 5x - 1$

(2) $\dfrac{1}{3}x^3 + 5x + 1$

(3) $x^3 + 5x + 1$

(4) $x^3 + 5x - 1$

55. The value of $\displaystyle\int_{-2}^{2} (px^3 + qx + r)\,dx$, is :

(1) r

(2) $2r$

(3) $3r$

(4) $4r$

P. T. O.

56. $\int \dfrac{\sin x + \cos x}{\sqrt{1 + \sin 2x}}\, dx = ?$

(1) $\sin x + c$

(2) $x + c$

(3) $\cos x + c$

(4) $x^2 + c$

57. Area bounded by the curve $y = \log x$, x–axis and the ordinates $x = 1$, $x = 2$ is :

(1) $\log 4$ sq. unit

(2) $(\log 4 - 1)$ sq. unit

(3) $(\log 4 + 1)$ sq. unit

(4) $(\log 4 - 2)$ sq. unit

58. The general solution of $x^2 \dfrac{dy}{dx} = 6$ is :

(1) $y = \dfrac{-6}{x} + c$

(2) $y = \dfrac{6}{x} + c$

(3) $y = \dfrac{12}{x} + c$

(4) $y = x + c$

59. The order and degree of differential equation $\dfrac{d^4 y}{dx^4} - 4\dfrac{d^3 y}{dx} + 8\dfrac{d^2 y}{dx^2} - 8\dfrac{dy}{dx} + 4y = 0$ are :

(1) $(4, 4)$

(2) $(4, 1)$

(3) $(1, 1)$

(4) $(1, 4)$

60. The maximum value of :

$P = x + 3y$

Such that :

$2x + y \le 20$

$x + 2y \le 20$

$x \ge 0,\ y \ge 0$, is :

(1) 10

(2) 60

(3) 30

(4) 25

61. How many subsets can be formed from the following set :

$\{1, 2, 3 \ldots\ldots n\}$

(1) n

(2) n^2

(3) $2n$

(4) 2^n

62. If $A = \{1, 2, 3\}$, $B = \{3, 4\}$, $C = \{4, 5, 6\}$, then $A \cup (B \cap C)$ is :

(1) $\{3\}$

(2) $\{1, 2, 3, 4\}$

(3) $\{1, 2, 3, 5\}$

(4) $\{1, 2, 3, 4, 5, 6\}$

63. In rule method, the null set is represented by :

(1) $\{ \}$

(2) ϕ

(3) $\{x : x = x\}$

(4) $\{x : x \neq x\}$

64. Let U = $\{1, 2, 3, \ldots\ldots 10\}$, A = $\{1, 2, 5\}$, B = $\{6, 7\}$, then A $\cap$ B' is (Where A' & B' represent compliment of A and B respectively) :

(1) A

(2) B'

(3) A'

(4) B

65. In a group of 70 people, 37 like coffee , 52 like tea and each person likes at least one of the two drives. How many like both coffee and tea ?

(1) 17

(2) 18

(3) 19

(4) 20

66. The inequality $\frac{2}{x} < 3$ is true, when x belongs to :

(1) $\left[\frac{2}{3}, \infty\right)$

(2) $\left(-\infty, \frac{2}{3}\right]$

(3) $\left(\frac{2}{3}, \infty\right) \cup (-\infty, 0)$

(4) None of these

67. If $A = \{1, 2, 4\}$, then the identity relation on A is :

(1) $\{(1, 1)\}$

(2) $\{(1, 1)(1, 2)\}$

(3) $\{(2, 2), (1, 4)\}$

(4) $\{(1, 1), (2, 2), (4, 4)\}$

68. Let $A = \{x, y, z\}$ and $B = \{1, 2\}$, then the number of relations from A into B are :

(1) 2^5

(2) 2^6

(3) 2^3

(4) 2^2

69. The radian measure corresponding to $-47°30'$ is :

(1) $-\frac{15}{72}\pi$

(2) $\frac{15}{72}\pi$

(3) $-\frac{19}{72}\pi$

(4) $\frac{19}{72}\pi$

70. The value of $\sin\left(\frac{7\pi}{6}\right)$ is :

(1) $-\frac{\sqrt{3}}{2}$

(2) $\frac{1}{2}$

(3) $-\frac{1}{\sqrt{2}}$

(4) $\frac{\sqrt{3}}{2}$

71. Which of the following can not be the probability of occurrence of an event ?

(1) $\dfrac{2}{3}$

(2) $\dfrac{3}{2}$

(3) 0

(4) 1

72. In an experiment of rolling a fair die and unbiased coin, the sample space is :

(1) $\{H1, H2, H3, H4, H5, H6\}$

(2) $\{T1, T2, T3, T4, T5, T6\}$

(3) $\{H1, H2, H3, T4, T5, T6\}$

(4) $\{H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6\}$

73. If $P(A) = 0.37$, $P(B) = 0.42$, $P(A \cap B) = 0.09$, then $P(A \cup B)$ is :

(1) 0.7   (2) 0.8

(3) 0.68   (4) 0.75

74. Probability of occurrence of an impossible event is :

(1) 1   (2) 2

(3) 0   (4) 0.5

75. A family has two children. What is the probability that both the children are boys, given that at least one of them is a boy ?

(1) $\dfrac{3}{4}$

(2) $\dfrac{1}{4}$

(3) $\dfrac{1}{2}$

(4) $\dfrac{1}{3}$

76. Given that $P(A) = \dfrac{1}{3}$, $P(B) = \dfrac{3}{4}$ and $P(A \cup B) = \dfrac{11}{12}$, then $P(B/A)$ is :

    (1) $\dfrac{1}{6}$

    (2) $\dfrac{5}{6}$

    (3) $\dfrac{2}{9}$

    (4) $\dfrac{1}{2}$

77. If $^5P_r = 2 \cdot {}^6p_{r-1}$, then value of '$r$' is :

    (1) 1

    (2) 2

    (3) 3

    (4) 4

78. In how many ways can 5 men and 4 women be seated in a row so that the women occupy the even places ?

    (1) 2880

    (2) 2860

    (3) 2800

    (4) 2820

79. The value of $^nP_{n-1}$ is :

    (1) $n\,!$

    (2) n

    (3) $2n\,!$

    (4) $2n$

80. The number of squares that can be formed on a Chessboard :

    (1) 224

    (2) 204

    (3) 160

    (4) 64

81. 'Page' is related to 'Book' as 'Leaf' is related to :

   (1) Root

   (2) Tree

   (3) Fruit

   (4) Forest

82. Newspaper : Press : : Cloth : ?

   (1) Fibre   (2) Textile

   (3) Tailor   (4) Mill

83. In 10 years, 'A' will be twice as old as 'B' was 10 years ago. If at present 'A' is 9 years older than 'B', the present age of 'B' is :

   (1) 19 years

   (2) 29 years

   (3) 39 years

   (4) 59 years

84. Pointing towards a person, a man said to a woman "His mother is the only daughter of your father". How is woman related to that person ?

   (1) Daughter   (2) Mother

   (3) Sister   (4) Wife

85. Mirror image of [→] is :

   (1) [→]

   (2) [←]

   (3) [←]

   (4) [→]

86. Calculate the simple interest of Rs. 7200 at $12\frac{3}{4}\%$ per annum for 9 months :

(1) Rs. 688.50

(2) Rs. 670.50

(3) Rs. 700.1

(4) Rs. 690

87. A man buys 25 chairs for Rs. 375 and sells them at profit equal to the selling price of 5 chairs. What is the selling price of one chair ?

(1) Rs. 14.50

(2) Rs. 15.20

(3) Rs. 17.20

(4) Rs. 18.75

88. A man riding on a bicycle at a speed of 15 km/h crosses a bridge in 5 minute. The length of the bridge is :

(1) 1 km

(2) $1\frac{1}{4}$ km

(3) 2 km

(4) $2\frac{1}{2}$ km

89. The HCF of $\frac{9}{10}, \frac{12}{25}, \frac{18}{25}$ and $\frac{21}{40}$ is :

(1) $\frac{3}{5}$

(2) $\frac{252}{5}$

(3) $\frac{3}{1400}$

(4) $\frac{52}{140}$

90. Find the missing number :

(1) 37

(2) 41

(3) 47

(4) 18

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92. Which of the following is a measure of central tendency ?

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(3) Quartile deviation

(4) Standard deviation

93. Pie chart represents the components of a factor by :

(1) Angles

(2) Percentages

(3) Sectors

(4) None of these

94. What is the main purpose of statistics ?

(1) To collect data

(2) To analyse data

(3) To interpret data

(4) All of these

95. Which of the following is an example of qualitative data ?

(1) Height

(2) Weight

(3) Age

(4) Gender

96. Which of the following is a measure of dispersion ?

    (1) Variance

    (2) Median

    (3) Mode

    (4) Mean

97. Which type of data is best represented by a histogram ?

    (1) Categorical

    (2) Discrete

    (3) Continuous

    (4) Nominal

98. If a constant value 5 is subtracted from each observation of a set, then the mean of the set is :

    (1) Increased by 5

    (2) Decreased by 5

    (3) Decreased by 25

    (4) is not affected

99. Geometric mean of two numbers $\frac{1}{16}$ and $\frac{4}{25}$, is :

    (1) $\frac{1}{10}$ (2) $\frac{1}{100}$

    (3) 10   (4) 100

100. The standard deviation of the following data is :

    $-1, -2, -3, -4, -5, -6, -7$

    (1) -2 (2) 4

    (3) 2   (4) -4

D

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

SET-Y

10032

UG-EE-June, 2024
SUBJECT : Statistics (4 Year)

Sr. No. ....

Time : 1¼ Hours   Max. Marks : **100**   Total Questions : **100**

Roll No. (in figures)_____ (in words) _____

Name _____ Date of Birth_____

Father's Name _____ Mother's Name _____

Date of Examination _____

_____   _____
(Signature of the Candidate)   (Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. *All questions are compulsory.*

2. The candidates **must return** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.

4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.

5. The candidate **must not** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers **must not** be ticked in the question booklet.

6. *There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.*

7. Use only **Black** or **Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.

8. *Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained* **30** *minutes after starting of the examination.*

UG-EE-June, 2024/(Statistics-4 Yr.)(SET-Y)/(D)

2

6. Calculate the simple interest of Rs. 7200 at $12\frac{3}{4}\%$ per annum for 9 months :

(1) Rs. 688.50

(2) Rs. 670.50

(3) Rs. 700.1

(4) Rs. 690

7. A man buys 25 chairs for Rs. 375 and sells them at profit equal to the selling price of 5 chairs. What is the selling price of one chair ?

(1) Rs. 14.50

(2) Rs. 15.20

(3) Rs. 17.20

(4) Rs. 18.75

8. A man riding on a bicycle at a speed of 15 km/h crosses a bridge in 5 minute. The length of the bridge is :

(1) 1 km

(2) $1\frac{1}{4}$ km

(3) 2 km

(4) $2\frac{1}{2}$ km

9. The HCF of $\frac{9}{10}, \frac{12}{25}, \frac{18}{25}$ and $\frac{21}{40}$ is :

(1) $\frac{3}{5}$

(2) $\frac{252}{5}$

(3) $\frac{3}{1400}$

(4) $\frac{52}{140}$

10. Find the missing number :

(1) 37

(2) 41

(3) 47

(4) 18

11. If $x = t^2$ and $y = t^3$, then $\dfrac{d^2 y}{dx^2} = ?$

    (1) $\dfrac{3}{4t}$ (2) $\sqrt{t}$

    (3) t (4) $\dfrac{3}{2\sqrt{t}}$

12. The rate of change of the area of a circle with respect to its radius $'r'$ where $r = 3$ cm, is :

    (1) 2π (2) 4π

    (3) 6π (4) 10π

13. The point, at which the tangent to the curve $y = \sqrt{4x - 3} - 1$ has its slope $\dfrac{2}{3}$, is :

    (1) $(1, 2)$ (2) $(2, 1)$

    (3) $(2, 3)$ (4) $(3, 2)$

14. If $f'(x) = x^2 + 5$ and $f(0) = -1$, then $f(x) = ?$

    (1) $\dfrac{1}{3}x^3 + 5x - 1$

    (2) $\dfrac{1}{3}x^3 + 5x + 1$

    (3) $x^3 + 5x + 1$

    (4) $x^3 + 5x - 1$

15. The value of $\displaystyle\int_{-2}^{2} (px^3 + qx + r)\,dx$, is :

    (1) r

    (2) $2r$

    (3) $3r$

    (4) $4r$

16. $\int \dfrac{\sin x + \cos x}{\sqrt{1 + \sin 2x}}\, dx = ?$

   (1) $\sin x + c$

   (2) $x + c$

   (3) $\cos x + c$

   (4) $x^2 + c$

17. Area bounded by the curve $y = \log x$, x-axis and the ordinates $x = 1$, $x = 2$ is :

   (1) $\log 4$ sq. unit

   (2) $(\log 4 - 1)$ sq. unit

   (3) $(\log 4 + 1)$ sq. unit

   (4) $(\log 4 - 2)$ sq. unit

18. The general solution of $x^2 \dfrac{dy}{dx} = 6$ is :

   (1) $y = \dfrac{-6}{x} + c$

   (2) $y = \dfrac{6}{x} + c$

   (3) $y = \dfrac{12}{x} + c$

   (4) $y = x + c$

19. The order and degree of differential equation $\dfrac{d^4 y}{dx^4} - 4\dfrac{d^3 y}{dx} + 8\dfrac{d^2 y}{dx^2} - 8\dfrac{dy}{dx} + 4y = 0$ are :

   (1) $(4, 4)$

   (2) $(4, 1)$

   (3) $(1, 1)$

   (4) $(1, 4)$

20. The maximum value of :

   $P = x + 3y$

   Such that :

   $2x + y \leq 20$

   $x + 2y \leq 20$

   $x \geq 0,\ y \geq 0$, is :

   (1) 10

   (2) 60

   (3) 30

   (4) 25

21. The mean of 5 observations 1, 2, 6, x and y is 4·2, then $x + y$ is :

(1) 4

(2) 8

(3) 15

(4) 12

22. Mean deviation for 'n' observations $x_1, x_2, ..., x_n$ from their mean $\overline{X}$ is :

(1) $\dfrac{1}{n} \sum\limits_{i=1}^{n} (X_i - \overline{X})^2$

(2) $\dfrac{1}{n} \sum\limits_{i=1}^{n} | X_i - \overline{X} |$

(3) $\sum\limits_{i=1}^{n} (X_i - \overline{X})^2$

(4) $\sum\limits_{i=1}^{n} | X_i - \overline{X} |$

23. Mean of first 'n' natural number is :

(1) $\dfrac{n}{2}$

(2) $\dfrac{n(n+1)}{2}$

(3) $\dfrac{n+1}{2}$

(4) $\dfrac{n-1}{2}$

24. The standard deviation of 10 observations is 09. If 2 is subtracted from each observation, then the new standard deviation is :

(1) 09

(2) 11

(3) 08

(4) 07

25. Mean deviation from the median for the following data is :

3, 9, 6, 8, 4, 12, 19, 21

(1) 2

(2) 3

(3) 4

(4) 5

26. What is the harmonic mean of 5 and 2 ?

(1) $\dfrac{20}{7}$

(2) $\dfrac{30}{7}$

(3) $\dfrac{10}{7}$

(4) $\dfrac{40}{7}$

27. The sum of deviations about mean is :

(1) Largest

(2) Smallest

(3) Positive

(4) Zero

28. The relationship between arithmetic mean (A. M.), geometric mean (G. M.) and harmonic mean (H. M.) can be expressed as :

(1) A. M. ≥ G. M. ≥ H. M.

(2) A. M. = G. M. − H. M.

(3) G. M. ≥ H. M. ≥ A. M.

(4) A. M. ≤ G. M. ≤ H. M.

29. The range is calculated as :

(1) The sum of all data values

(2) The product of all data values

(3) The square of the mean deviation

(4) The difference between the largest and smallest data values

30. Mode of the following data is :

3, 2, 5, 2, 3, 5, 6, 5, 6, 3, 2, 5, 1

(1) 2

(2) 3

(3) 5

(4) 6

31. For any positive integer n, $\underset{x \to a}{Lim} \dfrac{x^n - a^n}{x - a}$ is :

(1) 0

(2) 1

(3) na^n

(4) na^{n-1}

32. $\underset{x \to 0}{Lim} \dfrac{\sin 4x}{\sin 2x}$ is equal to :

(1) 0

(2) 1

(3) 2

(4) 3

33. $\underset{\theta \to \frac{\pi}{2}}{Lim} (\sec \theta - \tan \theta) = ?$

(1) 0

(2) 1

(3) −1

(4) ∞

34. If $f(x) = x \sin x$, then $f'\left(\dfrac{\pi}{2}\right)$ is :

(1) 0

(2) 1

(3) −1

(4) $\dfrac{1}{2}$

35. Derivative of e^{x^2} is :

(1) e^{x^2}

(2) $2x$

(3) $2e^{x^2}$

(4) $2x e^{x^2}$

8

D

36. A function $f(x)$ is not continuous at $x=1$ if :

(1) $\underset{x \to}{Lim}\ f(x) \neq f(1)$

(2) $\underset{x \to 1}{Lim}\ f(x) = f(1)$

(3) $f^1(1) \neq 0$

(4) None of these

37. If $f(x) = \begin{cases} x+\lambda & ; & x<3 \\ 4 & ; & x=3 \\ 3x-5 & ; & x>3 \end{cases}$ is continuous at $x=3$, then the value of λ is :

(1) 1

(2) -2

(3) -1

(4) 0

38. If f and g be two real functions continuous at a real number 'C', then which one of the following is not true ?

(1) $f+g$ is continuous at $x=c$

(2) $f-g$ is continuous at $x=c$

(3) $f.g$ is continuous at $x=c$

(4) $\dfrac{f}{g}$ is continuous at $x=c$, if $g(0) \neq 0$

39. If $x-y=\pi$, then $\dfrac{dy}{dx}=$?

(1) 0

(2) 1

(3) 2

(4) 3

40. If $x=a(t-\sin t)$ and $y=a(1-\cos t)$ then $\dfrac{dy}{dx}=$?

(1) $\sec t$

(2) $\operatorname{cosec} t$

(3) $\tan \dfrac{t}{2}$

(4) $\cot \dfrac{t}{2}$

41. The primary data is gathered through :

    (1) Survey (2) Books

    (3) Newspaper (4) Internet

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    (2) Mean

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    (1) Height

    (2) Weight

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49. Geometric mean of two numbers $\frac{1}{16}$ and $\frac{4}{25}$, is :

(1) $\frac{1}{10}$

(2) $\frac{1}{100}$

(3) 10

(4) 100

50. The standard deviation of the following data is :

$-1, -2, -3, -4, -5, -6, -7$

(1) -2

(2) 4

(3) 2

(4) -4

51. A class of 30 boys and 15 girls is given a test in statistics. The average marks obtained by boys is 15 and by girls is 6. The average of whole class is :

(1) 10.5

(2) 12

(3) 12.5

(4) 10

52. The sum of square of deviations for 10 observations taken from mean is 250. The value of variance is :

(1) 25   (2) 30

(3) 40   (4) 45

53. The variance of 6, 8, 10, 12, 14 is :

(1) 1

(2) 12

(3) 18

(4) 8

54. The mean of 8 numbers is 15. A new number 24 is added. The mean of nine numbers is :

(1) 18   (2) 16

(3) 12   (4) 11

55. The median of the series :

3, 18, 7, 20, 11, 12, 9, 17, 22

(1) 11   (2) 12

(3) 10   (4) 8

56. Find out the missing number of the series :

2, 6, 14, 26, 42, ...

(1) 52 (2) 62

(3) 72 (4) 60

57. Find out the missing letters of the series :

x .... xx yyx .... xyyyxxxx

(1) x, x (2) y, y

(3) y, x (4) x, y

58. In a code language if 'TRAINS' is coded as 'RTIASN', how 'PISTOL' will be coded in the same language ?

(1) IPTSLO (2) IPSTLO

(3) SIPTLO (4) IPTLSO

59. A person started walking towards North. After walking 30 metres, he turned towards left and walked 40 metres. He then turned left and walked 30 metres. He again turned left and walked 50 metres. How far is he from his original position ?

(1) 40 metres (2) 30 metres

(3) 20 metres (4) 10 metres

60. If + means ×, − means +, × means ÷ and ÷ means −, then :

$6 − 3 + 8 × 3 ÷ 4 = ?$

(1) 4 (2) 5

(3) 10 (4) 12

61. Which of the following can not be the probability of occurrence of an event ?

(1) $\dfrac{2}{3}$

(2) $\dfrac{3}{2}$

(3) 0

(4) 1

62. In an experiment of rolling a fair die and unbiased coin, the sample space is :

(1) {H1, H2, H3, H4, H5, H6}

(2) {T1, T2, T3, T4, T5, T6}

(3) {H1, H2, H3, T4, T5, T6}

(4) {H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6}

63. If $P(A) = 0.37$, $P(B) = 0.42$, $P(A \cap B) = 0.09$, then $P(A \cup B)$ is :

(1) 0.7   (2) 0.8

(3) 0.68   (4) 0.75

64. Probability of occurrence of an impossible event is :

(1) 1   (2) 2

(3) 0   (4) 0.5

65. A family has two children. What is the probability that both the children are boys, given that at least one of them is a boy ?

(1) $\dfrac{3}{4}$

(2) $\dfrac{1}{4}$

(3) $\dfrac{1}{2}$

(4) $\dfrac{1}{3}$

66. Given that $P(A) = \dfrac{1}{3}$, $P(B) = \dfrac{3}{4}$ and $P(A \cup B) = \dfrac{11}{12}$, then P(B/A) is :

    (1) $\dfrac{1}{6}$ (2) $\dfrac{5}{6}$

    (3) $\dfrac{2}{9}$ (4) $\dfrac{1}{2}$

67. If $^5P_r = 2.\, ^6p_{r-1}$, then value of 'r' is :

    (1) 1   (2) 2

    (3) 3   (4) 4

68. In how many ways can 5 men and 4 women be seated in a row so that the women occupy the even places ?

    (1) 2880

    (2) 2860

    (3) 2800

    (4) 2820

69. The value of $^nP_{n-1}$ is :

    (1) $n!$ (2) n

    (3) $2n!$ (4) $2n$

70. The number of squares that can be formed on a Chessboard :

    (1) 224

    (2) 204

    (3) 160

    (4) 64

71. The number of ways 10 digits numbers can be written using the digits 1 and 2 :

(1) 10_{C_2}

(2) $10!$

(3) $10_{C_1} + 9_{C_2}$

(4) 2^{10}

72. In an experiment of tossing three coins at a time, the probability of getting 2 heads and one tail is :

(1) $\dfrac{1}{8}$

(2) $\dfrac{1}{3}$

(3) $\dfrac{3}{8}$

(4) $\dfrac{1}{2}$

73. If A and B are events such that $P(A/B) = P(B/A)$, then :

(1) $B \supset A$ but $A \neq B$

(2) $A = B$

(3) $A \cap B = \phi$

(4) $P(B) = P(A)$

74. If A and B are two independent events, then the probability of occurrence of at least one of A and B is given by :

(1) $P(A) + P(B)$

(2) $P(A) - P(B)$

(3) $P(A \cup B)$

(4) $P(A \cap B)$

75. If A and B are independent events such that $P(A) = \dfrac{3}{5}$ and $P(B) = \dfrac{1}{5}$, then $P(A \cap B)$ is :

(1) $\dfrac{3}{25}$

(2) $\dfrac{4}{5}$

(3) $\dfrac{3}{10}$

(4) $\dfrac{2}{5}$

D

76. In context to the Bernoulli trials, which one of the following is not true ?

(1) There should be a finite number of trials

(2) The trials should be independent

(3) Each trial has more than two outcomes

(4) The probability of success remains the same in each trial

77. Probability can take values :

(1) 0 to 2

(2) -2 to 2

(3) $-\infty$ to 1

(4) -1 to 1

78. In case of binomial distribution, for given values of 'n' and 'p', the probability of x successes $P(x = x)$ is given by :

(1) $^{x}c_{n}\, p^{x}\, q^{n-x}$

(2) $^{n}c_{x}\, p^{x} q^{n-x}$

(3) $p^{x} \cdot q^{n-x}$

(4) $^{n}c_{x}\, p^{x}\, q^{n}$

79. If a random variable x follows binomial distribution with 'n' number of trials and 'p' probability of success, then mean of x is :

(1) p

(2) $n(1-p)$

(3) npq

(4) np

80. The mean and variance of a binomial distribution are 8 and 4 respectively, then $P(x=1)$ is :

(1) $\dfrac{1}{2^{4}}$

(2) $\dfrac{1}{2^{8}}$

(3) $\dfrac{1}{2^{12}}$

(4) $\dfrac{1}{2^{6}}$

81. How many subsets can be formed from the following set :

$\{1, 2, 3 \ldots\ldots n\}$

(1) n

(2) n^2

(3) $2n$

(4) 2^n

82. If $A = \{1, 2, 3\}, B = \{3, 4\}, C = \{4, 5, 6\}$, then $A \cup (B \cap C)$ is :

(1) $\{3\}$

(2) $\{1, 2, 3, 4\}$

(3) $\{1, 2, 3, 5\}$

(4) $\{1, 2, 3, 4, 5, 6\}$

83. In rule method, the null set is represented by :

(1) $\{ \ \}$

(2) ϕ

(3) $\{x : x = x\}$

(4) $\{x : x \neq x\}$

84. Let $U = \{1, 2, 3, \ldots.. 10\}$, $A = \{1, 2, 5\}$, $B = \{6, 7\}$, then $A \cap B'$ is (Where A' & B' represent compliment of A and B respectively) :

(1) A

(2) B'

(3) A'

(4) B

85. In a group of 70 people, 37 like coffee , 52 like tea and each person likes at least one of the two drives. How many like both coffee and tea ?

(1) 17

(2) 18

(3) 19

(4) 20

86. The inequality $\dfrac{2}{x} < 3$ is true, when x belongs to :

(1) $\left[\dfrac{2}{3}, \infty\right)$

(2) $\left(-\infty, \dfrac{2}{3}\right]$

(3) $\left(\dfrac{2}{3}, \infty\right) \cup (-\infty, 0)$

(4) None of these

87. If $A = \{1, 2, 4\}$, then the identity relation on A is :

(1) $\{(1, 1)\}$

(2) $\{(1, 1)\,(1, 2)\}$

(3) $\{(2, 2), (1, 4)\}$

(4) $\{(1, 1), (2, 2), (4, 4)\}$

88. Let $A = \{x, y, z\}$ and $B = \{1, 2\}$, then the number of relations from A into B are :

(1) 2^5

(2) 2^6

(3) 2^3

(4) 2^2

89. The radian measure corresponding to $-47°30'$ is :

(1) $-\dfrac{15}{72}\pi$

(2) $\dfrac{15}{72}\pi$

(3) $-\dfrac{19}{72}\pi$

(4) $\dfrac{19}{72}\pi$

90. The value of $\sin\left(\dfrac{7\pi}{6}\right)$ is :

(1) $-\dfrac{\sqrt{3}}{2}$

(2) $\dfrac{1}{2}$

(3) $-\dfrac{1}{\sqrt{2}}$

(4) $\dfrac{\sqrt{3}}{2}$

91. The additive inverse of $(2+3i)^2$ is :

    (1) $-5+12i$

    (2) $-9+12i$

    (3) $5-12i$

    (4) $9-12i$

92. Multiplicative inverse of $4+7i$ is :

    (1) $(-4-7i)$

    (2) $-4+7i$

    (3) $-\dfrac{4}{65}+\dfrac{7}{65}i$

    (4) $\dfrac{4}{65}-\dfrac{7}{65}i$

93. How many terms are there in A. P. 20, 22, 24, 26, ..., 100 ?

    (1) 40   (2) 41

    (3) 42   (4) 43

94. The sum of the first 15 terms of the A. P. 5, 10, 15, 20, ... is :

    (1) 400

    (2) 425

    (3) 600

    (4) 525

95. If $\begin{bmatrix} 1 & 0 \\ 3 & -4 \end{bmatrix} + \begin{bmatrix} a & 1 \\ -1 & b \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ 2 & -2 \end{bmatrix}$, then value of a and b are :

    (1) $1, -2$

    (2) $-1, 2$

    (3) $-1, -2$

    (4) $1, 2$

96. Inverse matrix of $\begin{bmatrix} 2 & -3 \\ -4 & 2 \end{bmatrix}$ is :

(1) $-\dfrac{1}{8}\begin{bmatrix} 2 & 3 \\ 4 & 2 \end{bmatrix}$

(2) $-\dfrac{1}{8}\begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$

(3) $\dfrac{1}{8}\begin{bmatrix} 2 & 3 \\ 4 & 2 \end{bmatrix}$

(4) $\dfrac{1}{8}\begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$

97. The minor of -3 in the determinant $\begin{vmatrix} 2 & -3 & 1 \\ 4 & 0 & 5 \\ -1 & 6 & 7 \end{vmatrix}$ is :

(1) 30

(2) 33

(3) 28

(4) 32

98. Let A be a square matrix of order 3×3, then $|KA|$ is :

(1) $3K\,|A|$

(2) $K\,|A|$

(3) $K^2\,|A|$

(4) $K^3\,|A|$

99. Matrices A and B will be inverse of each other only if :

(1) $AB = BA$

(2) $AB = BA = 0$

(3) $AB = BA = I$

(4) $AB = I, BA = 0$

100. Which of the following is not a property of inverse of a matrix ?

(1) $(A^{-1})^{-1} = A$

(2) $(A^T)^{-1} = (A^{-1})^T$

(3) $(AB)^{-1} = A^{-1}B^{-1}$

(4) $Adj(A^{-1}) = (Adj\ A)^{-1}$

Q. NO.	A	B	C	D
Answer keys of Bachelor of Science (STATISTICS) 4-Years entrance exam dated 21.06.2024				
1	4	2	4	2
2	2	1	3	4
3	4	4	1	3
4	1	2	2	2
5	3	2	4	2
6	3	2	1	1
7	4	3	1	4
8	2	1	3	2
9	3	4	2	3
10	1	3	4	2
11	3	4	4	1
12	4	2	3	3
13	2	3	4	4
14	3	1	3	1
15	4	4	1	4
16	1	1	3	2
17	2	4	4	2
18	4	1	2	1
19	3	4	4	2
20	3	3	3	3
21	4	2	2	4
22	3	4	1	2
23	1	3	4	3
24	2	2	2	1
25	4	2	2	4
26	1	1	2	1
27	1	4	3	4
28	3	2	1	1
29	2	3	4	4
30	4	2	3	3
31	1	4	4	4
32	3	2	2	3
33	4	4	3	1
34	1	1	1	2
35	4	3	4	4
36	2	3	1	1
37	2	4	4	1
38	1	2	1	3
39	2	3	4	2
40	3	1	3	4
41	2	4	3	1
42	4	3	4	2
43	1	4	2	3
44	3	3	3	4
45	4	1	4	4
46	4	3	1	1
47	3	4	2	3
48	1	2	4	2
49	1	4	3	1
50	2	3	3	3

Q. NO.	A	B	C	D
Answer keys of Bachelor of Science (STATISTICS) 4-Years entrance exam dated 21.06.2024				
51	4	1	1	2
52	3	2	3	1
53	4	3	4	4
54	3	4	1	2
55	1	4	4	2
56	3	1	2	2
57	4	3	2	3
58	2	2	1	1
59	4	1	2	4
60	3	3	3	3
61	1	4	4	2
62	2	3	2	4
63	3	1	4	1
64	4	2	1	3
65	4	4	3	4
66	1	1	3	4
67	3	1	4	3
68	2	3	2	1
69	1	2	3	1
70	3	4	1	2
71	4	3	2	4
72	2	4	4	3
73	3	2	1	4
74	1	3	3	3
75	4	4	4	1
76	1	1	4	3
77	4	2	3	4
78	1	4	1	2
79	4	3	1	4
80	3	3	2	3
81	2	2	2	4
82	1	4	4	2
83	4	1	3	4
84	2	3	2	1
85	2	4	2	3
86	2	4	1	3
87	3	3	4	4
88	1	1	2	2
89	4	1	3	3
90	3	2	2	1
91	2	1	1	3
92	4	3	2	4
93	3	4	3	2
94	2	1	4	3
95	2	4	4	4
96	1	2	1	1
97	4	2	3	2
98	2	1	2	4
99	3	2	1	3
100	2	3	3	3