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Paper Code		
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(To be filled in the OMR Sheet)		

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No.

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प्रश्नपुस्तिका सीरीज
Question Booklet Series
B

B.Sc. (First Semester) Examination, February/March-2022

B060101T

Statistics

Descriptive Statistics (Univariate) and Theory of Probability

Time : 1:30 Hours

Maximum Marks-100

जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें

- निर्देश : —
1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही— सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
 2. इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमें से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने हैं। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET) में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वाइंट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा निर्धारित प्रश्नों से अधिक प्रश्नों के उत्तर दिये जाते हैं तो उसके द्वारा हल किये गये प्रथमतः यथा निर्दिष्ट प्रश्नोत्तरों का ही मूल्यांकन किया जायेगा।
 3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
 4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक (O.M.R. ANSWER SHEET) पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
 5. ओ०एम०आर० उत्तर पत्रक (O.M.R. ANSWER SHEET) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
 6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक—पृथक उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
 7. निगेटिव मार्किंग नहीं है।

महत्वपूर्ण : — प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।

1. The outcomes of tossing a coin is :
 - (A) Simple Event
 - (B) Mutually exclusive event
 - (C) Compound Event
 - (D) None of these
2. Probability can take value from :
 - (A) $-\infty$ to ∞
 - (B) $-\infty$ to 1
 - (C) -1 to 1
 - (D) 0 to 1
3. If $P(A \cup B) = P(A) + P(B)$, then the two events A and B are :
 - (A) Independent
 - (B) Equally likely
 - (C) Dependent
 - (D) None of above
4. Probability is expressed as :
 - (A) Ratio
 - (B) Proportion
 - (C) Percentage
 - (D) All of the above
5. If $P(B/A) = P(B)$, then the two events A and B are :
 - (A) Independent
 - (B) Equally likely
 - (C) Dependent
 - (D) None of above

6. If for two events A and B, $P(A \cup B) = 0.6$, $P(A) = 0.8$ and $P(A \cap B) = 0.6$, then $P(B)$ is :
- (A) 0.60
 - (B) 0.40
 - (C) 0.8
 - (D) None of these
7. If $P(A) = 0.4$, $P(B) = 0.2$ and the events A and B are mutually exclusive then $P(AB)$ is :
- (A) 0.08
 - (B) 0
 - (C) 0.6
 - (D) None of the above
8. If an event A is independent of the events, B ($B \cap C$), then A and C are :
- (A) Independent
 - (B) Dependent
 - (C) Mutually exclusive
 - (D) None of these
9. Which of the following is true ?
- (A) $P(A \cap B) \leq P(A) \leq P(A \cup B) \leq P(A) + P(B)$
 - (B) $P(A \cap B) \geq P(A) \geq P(A \cup B) \geq P(A) + P(B)$
 - (C) $P(A) \leq P(A \cap B) \leq P(A) + P(B) \leq P(A \cup B)$
 - (D) None of these
10. Classical probability is also known as :
- (A) Laplace's Probability
 - (B) Mathematical Probability
 - (C) Priori Probability
 - (D) All the above

11. If A and B are two events, the probability of occurrence of A and B simultaneously is :
- (A) $P(A) + P(B)$
 - (B) $P(A \cup B)$
 - (C) $P(A \cap B)$
 - (D) $P(A)P(B)$
12. If A is an event, the conditional probability of A given :
- (A) Zero
 - (B) One
 - (C) Infinite
 - (D) Indeterminate quantity
13. If $B \subset A$, the probability of $P(A/B)$ is equal to :
- (A) Zero
 - (B) One
 - (C) $P(A)/P(B)$
 - (D) $P(B)/P(A)$
14. If A and B are two events, the probability of occurrence of either A or B is given as:
- (A) $P(A) + P(B)$
 - (B) $P(A \cup B)$
 - (C) $P(A \cap B)$
 - (D) $P(A)P(B)$
15. For Any two events A and B, $P(A-B)$ is equal to :
- (A) $P(A) - P(B)$
 - (B) $P(B) - P(A)$
 - (C) $P(B) - P(AB)$
 - (D) $P(A) - P(AB)$

16. If odds for an event are 5:1, the probability of non-happening of the event is :
- (A) $1/2$
 - (B) $5/6$
 - (C) $1/3$
 - (D) $1/6$
17. If X is a random variable, the $E(t^x)$ is known as :
- (A) Characteristic function
 - (B) Moment generating function
 - (C) Probability generating function
 - (D) None of these
18. Two random variables X and Y are said to be independent if :
- (A) $E(XY) = 1$
 - (B) $E(XY) = 0$
 - (C) $E(XY) = E(X) E(Y)$
 - (D) $E(XY) = \text{any constant}$
19. The cumulative distribution $F(x)$ of a continuous random variable X is defined as $F(x) = \int_{-\infty}^x f(t) dt$ and the limits of X are :
- (A) $-\infty < x < 0$
 - (B) $0 < x < \infty$
 - (C) $-\infty < x < \infty$
 - (D) None of above
20. For $f(x)$ to be a discrete probability distribution $f(x)$ should satisfy the following conditions :
- (A) $f(x) \geq 0, \sum_x f(x) < 1$
 - (B) $f(x) \geq 0, \sum_x f(x) = 1$
 - (C) $f(x) \leq 0, \sum_x f(x) = 1$
 - (D) None of above

21. If $X = cV$, then $M_x(t)$:
- (A) $M_c(V_t)$
 - (B) $M_V(ct)$
 - (C) $M_x(t)$
 - (D) None of above
22. All the cumulant are independent of change of origin except :
- (A) The first
 - (B) The Last
 - (C) Both (A) and (B)
 - (D) None of these
23. The moment generating function of a discrete random variable is given by :
- (A) $M_x(t) = \sum_x e^{tx}$
 - (B) $M_x(t) = \sum_x e^{tf(x)}$
 - (C) $M_x(t) = \sum_x e^{tx}f(x)$
 - (D) None of these
24. Let x be a random variable and $ax+b$, be its linear function the $M_{ax+b}(t)$ is :
- (A) $e^{bt}M_x(at)$
 - (B) $e^{at}M_x(bt)$
 - (C) $e^{abt}M_x(t)$
 - (D) None of these
25. Which of the following are true :
- (A) A random variable may not have any moment although its M.G.F. exists
 - (B) A random variable may have same moments although its moment generating function does not exist
 - (C) Both (A) and (B)
 - (D) None of these

26. The logarithm of the moment generating function of a distribution is called :
- (A) Cumulant generating function
 - (B) p.d.f.
 - (C) Characteristic function
 - (D) None of these
27. The cumulant generating function of the sum of independent random variable :
- (A) The sum of their cumulant generating functions
 - (B) The product of their cumulant generating functions
 - (C) The difference of their cumulant generating functions
 - (D) None of these
28. The characteristic function exists always for :
- (A) A discrete random variable
 - (B) A continuous random variable
 - (C) Both (A) and (B)
 - (D) None of these
29. Which of the following is true in case of convergence in probability :
- (A) $\lim_{n \rightarrow \infty} P[|x_n - c| \geq \varepsilon] = 0$
 - (B) $\lim_{n \rightarrow \infty} P[|x_n - c| \leq \varepsilon] = 0$
 - (C) $\lim_{n \rightarrow \infty} P[|x_n| \geq \varepsilon] = 0$
 - (D) Both (A) and (B)
30. A sequence of random variable $\{x_n\}, n = 1, 2, \dots$ is said to converge to a constant c strongly if :
- (A) $\lim_{n \rightarrow \infty} P[|x_n - c| = 0] = 1$
 - (B) $\lim_{n \rightarrow \infty} P[|x_n - c| > \varepsilon] = 0$
 - (C) Both (A) and (B)
 - (D) None of these

31. The covariance of two independent variates is equal to :
- (A) Zero
 - (B) Units
 - (C) The sum of their expectations
 - (D) The product of their expectations
32. If X_1 and X_2 are independent then $V(X_1 - X_2)$ is equal to :
- (A) $V(X_1) - V(X_2)$
 - (B) $V(X_1) + V(X_2)$
 - (C) $V(X_1) - V(X_2) - 2 \cos(X_1 X_2)$
 - (D) None of these
33. Which of the following is true :
- (A) If x and y are independent then $f_{xy} = 0$
 - (B) If $f_{xy} = 0$ then x and y may or may not be independent
 - (C) Both (A) and (B)
 - (D) None of these
34. If x is a random variable, $E(e^{itx})$ is known as :
- (A) Characteristic function
 - (B) M.G.F.
 - (C) P.d.f.
 - (D) All the above
35. If X and Y are two random variables, then :
- (A) $E\{(XY)^2\} = E(X^2) E(Y^2)$
 - (B) $E\{(XY)^2\} = E(X^2 Y^2)$
 - (C) $E\{(XY)^2\} \geq E(X^2) E(Y^2)$
 - (D) $E\{(XY)^2\} \leq E(X^2) E(Y^2)$

36. If x is random variable with its mean \bar{x} , the expression $E(x - \bar{x})^2$ represents :
- (A) The variable of x
 - (B) Second central moment
 - (C) Both (A) and (B)
 - (D) None of these
37. The value of $E(x^2) - [E(x)]^2$ is called :
- (A) Mean
 - (B) Variance
 - (C) Median
 - (D) None of these
38. If a and b are constants, then $E(ax + b)$ is :
- (A) $E(a)X + b$
 - (B) $aE(x) + b$
 - (C) $E(ax) + E(b)$
 - (D) None of these
39. For any two events A and B :
- (A) $P(A \cap B) \leq P(A) \leq P(A \cup B) \leq P(A) + P(B)$
 - (B) $P(A) + P(B) \geq P(A) \geq P(A \cup B)$
 - (C) $P(A \cap B) \geq P(A) \geq P(A \cup B) \geq P(A) + P(B)$
 - (D) None of these
40. If $P(A \cap B) = P(A)P(B)$, the events A and B are :
- (A) Independent
 - (B) Mutually exclusive
 - (C) Both (A) and (B)
 - (D) None of these

41. Two events A and B are equal if :
- (A) $A \neq B$
 - (B) $A \subset B$
 - (C) $A > B$
 - (D) None of these
42. The conditional distribution $f(y/x)$ is equal to :
- (A) $f(x, y)/g(x); g(x) \neq 0$
 - (B) $f(x, y)/f(x); f(x) \neq 0$
 - (C) Both (A) and (B)
 - (D) None the above
43. If $U = (x - a)/h$, a and h being constants then $\phi_U(t)$ is :
- (A) $e^{it/h}\phi_x(t)$
 - (B) $e^{-iat/h}\phi_x(t/h)$
 - (C) Both (A) and (B)
 - (D) None of above
44. Quartiles can be obtained by :
- (A) Histogram
 - (B) Bar Diagram
 - (C) Ogive
 - (D) None of these
45. The Relation between A.M., G.M and H.M. is :
- (A) $A.M. < G.M. < H.M.$
 - (B) $A.M. \geq G.M. \geq H.M.$
 - (C) $A.M. > G.M. > H.M.$
 - (D) None of these

46. Which one of the following true :
- (A) $\text{Mean} + \text{Mode} = 3(\text{Mean} - \text{Median})$
 - (B) $\text{Mean} - \text{Mode} = 3(\text{Mean} - \text{Median})$
 - (C) $\text{Mean} - \text{Mode} = 3(\text{Mean} + \text{Median})$
 - (D) None of these
47. If an observation in series is zero, the G.M. is :
- (A) One
 - (B) Three
 - (C) Zero
 - (D) None of these
48. Second Quartile is also known as :
- (A) M.D.
 - (B) S.D.
 - (C) Median
 - (D) None of these
49. “Less than” and “More than” ogives intersect at :
- (A) Origin
 - (B) Mode
 - (C) Median
 - (D) None of these
50. While tabulating the grouped data :
- (A) Each group must have frequencies
 - (B) frequency can be Negative
 - (C) It is necessary to have frequencies
 - (D) None

51. The statement, “Statistics is both a science and an art.” was given by :
- (A) R. A. Fisher
 - (B) Tippet
 - (C) L.R. Connor
 - (D) A. L. Bowley
52. In the development of statistical methods, the greatest contribution is that of :
- (A) Economists
 - (B) Mathematicians
 - (C) Businessman
 - (D) Scientists
53. Which of the following represents data ?
- (A) A single data
 - (B) Only two value in a set
 - (C) A group of value in a set
 - (D) None of the above
54. Classification according to some attributes is an example of :
- (A) Quantitative Data
 - (B) Qualitative Data
 - (C) Measurement Statistics
 - (D) None of these
55. If definite breaks are not visible, data is called :
- (A) Discrete
 - (B) Continuous
 - (C) Smooth
 - (D) None

56. Data originally collected for an investigation is known as :
- (A) Primary Data
 - (B) Secondary Data
 - (C) Data
 - (D) None
57. Primary Data is preferred over secondary data because :
- (A) It is concise and accurate
 - (B) It contains no errors
 - (C) It shows greater details
 - (D) None of the above
58. Which of the following is primary data ?
- (A) Census of population data
 - (B) Wholesale price index number
 - (C) Statistics contained in Reserve Bank of India
 - (D) Data collected through own field survey
59. The sum of the frequencies of a particular class and of all the classes prior of the particular class is called :
- (A) Frequency
 - (B) Cumulative frequency
 - (C) Distribution table
 - (D) None
60. A Data has a maximum value of 88 and minimum value of 24. A frequency distribution in ascending order with eight classes is to be constructed. The first Interval shall be :
- (A) 88 and over
 - (B) 24 and less
 - (C) 80 and less than 88
 - (D) 24 and less than 32

61. Which of the following information is true about a frequency distribution ?
- (A) An ogive is a graph of cumulative frequency
 - (B) A Histogram is a line chart
 - (C) The width of classes should be equal
 - (D) A frequency polygon is a bar chart
62. The series :

Marks	No. of Students
20-30	5
30-40	14
40-50	24
50-60	12
60-70	9
70-80	2

is of the type,

- (A) Discrete Series
 - (B) Continuous Series
 - (C) Individual Series
 - (D) None of these
63. Ogive curve occur for :
- (A) More than type distribution
 - (B) Less than type distribution
 - (C) Both (A) and (B)
 - (D) None of these
64. In an Ogive Curve, the points are plotted for :
- (A) The values and frequencies
 - (B) The values and cumulative frequencies
 - (C) Frequencies and cumulative frequencies
 - (D) None of the above

65. Or frequency polygon has more than :
- (A) One Side
 - (B) Two Side
 - (C) Three Side
 - (D) Four Side
66. The number of Science, Art and Commerce graduates working in company is 30, 70 and 50 respectively. If we represent these figures by a pie-chart, the Angle Corresponding to Science graduates would be :
- (A) 30°
 - (B) 45°
 - (C) 72°
 - (D) 90°
67. Which of the following Series represents a ratio scale ?
- (A) 1, 2, 3, 5, 8 etc.
 - (B) 1, 2, 4, 8, 15, 30 etc.
 - (C) 1, 2, 3, 5, 9 etc.
 - (D) 1, 2, 4, 8, 16, 32 etc.
68. Pie-Diagrams are also called :
- (A) Bar Diagrams
 - (B) Diagrams
 - (C) Circular Diagrams
 - (D) Circle Diagrams
69. Which of the following can be found from a histogram ?
- (A) A. M.
 - (B) H. M.
 - (C) Mode
 - (D) Median

70. If a constant 5 is added to each observation of a set, the mean is :
(A) Increased by 5
(B) Decreased by 5
(C) 5 times occur
(D) Not affected
71. If median of a series is 10, two observations 8 and 21 are added to the series, the median of new series is :
(A) 12
(B) 8
(C) 10
(D) 11
72. The A. M. of the numbers 2, 7, 9, x, 6 is 7, then the value of x is :
(A) 13
(B) 11
(C) 10
(D) None
73. 7th decile is equal to :
(A) Median
(B) Q_1
(C) 70th Percentile
(D) 5th Octile
74. Mean Deviation about Median is :
(A) Minimum
(B) Maximum
(C) Zero
(D) Constant

75. If $n = 20$, $\Sigma x = 6$, and $\Sigma x^2 = 821$, the value of Mean and S.D. are:
- (A) 0.3, 6.4
 - (B) 3, 6.4
 - (C) 0.3, 64
 - (D) None
76. Standard deviation is always measured from :
- (A) Median
 - (B) Mean
 - (C) Mode
 - (D) Zero
77. Semi-interquartile Range is equal to :
- (A) $\frac{4}{5}$ S.D.
 - (B) $\frac{2}{3}$ S.D.
 - (C) $\frac{3}{4}$ S.D.
 - (D) None
78. By Skewness we mean :
- (A) Symmetry
 - (B) Lack in symmetry
 - (C) Flatness of the distribution
 - (D) None of these
79. When the coefficient of skewness is zero, the shape of the curve is :
- (A) T shaped
 - (B) L shaped
 - (C) Symmetrical
 - (D) None

80. For positively skewed distribution
- (A) Mean = Median = Mode
 - (B) Mean > Median > Mode
 - (C) Mean < Median < Mode
 - (D) None of these
81. The A. M. of n numbers of a series is \bar{x} . The sum of first $(n-1)$ terms is K , the n^{th} term will be :
- (A) K
 - (B) $(n\bar{x} - K)$
 - (C) $(\bar{x} - K)$
 - (D) None of these
82. The Relation between Quadratic Mean (Q. M.) and Arithmetic Mean (A. M.) is :
- (A) Q. M. = A. M.
 - (B) Q. M. > A. M.
 - (C) Q. M. < A. M.
 - (D) Q. M. \neq A. M.
83. The Relationship between mean deviation (M.D.) and Standard Deviation (S.D.) is :
- (A) $3 \text{ M. D.} = 2 \text{ S. D.}$
 - (B) $5 \text{ M. D.} = 4 \text{ S. D.}$
 - (C) $6 \text{ M. D.} = 5 \text{ S. D.}$
 - (D) $\text{M. D.} = \text{S. D.}$
84. Which of the following is a Measure of Skewness :
- (A) β_2
 - (B) β_1
 - (C) γ_2
 - (D) None of above

85. A Skewed Curve may be :
- (A) Positively Skewed
 - (B) Negatively Skewed
 - (C) Positively Skewed or Negatively Skewed
 - (D) Symmetrical
86. Which measure of dispersion ignores the Sign of deviation :
- (A) S. D.
 - (B) Q. D.
 - (C) M. D.
 - (D) None of these
87. The mean of absolute deviations from an Average is called :
- (A) S. D.
 - (B) M. D.
 - (C) Q. D.
 - (D) None of these
88. Quartiles, Percentiles, Deciles are called :
- (A) Division values
 - (B) Partition value
 - (C) Eigen values
 - (D) None of these
89. A Distribution having two mode is called :
- (A) Unimodal
 - (B) Bimodal
 - (C) Tri Modal
 - (D) None of these

90. The Mean of x_1, x_2, \dots, x_{10} , where $x_i = \frac{i^2}{7} + 5$; $i = 1, 2, \dots, 10$, is :
- (A) $\frac{11}{7}$
(B) $\frac{46}{7}$
(C) 5.5
(D) 10.5
91. If A.M. of two items is 5 and G.M. is 4, the items are :
- (A) 4 and 5
(B) 16 and 25
(C) 4 and 6
(D) 2 and 8
92. Which of the following is a measure of location :
- (A) Mode
(B) Correlation
(C) S.D.
(D) Kurtosis
93. The mean of the first n natural No. is :
- (A) $\frac{n(n+1)}{2}$
(B) $\frac{(n+1)}{2}$
(C) $(n + 1) \frac{(2n+1)}{6}$
(D) None of these
94. Which one of the following is not a measure of dispersion :
- (A) Range
(B) S.D.
(C) Mean Deviation
(D) First Quartile

95. The S.D. of 15 items is 6; if each item is increased by 2, then new S.D. will be :
(A) 5
(B) 6
(C) 4
(D) 2
96. If mean, median and mode of a distribution are equal, the distribution is called :
(A) + vely Skewed
(B) - vely Skewed
(C) Symmetrical
(D) None
97. Which measures of variation is most affected by extreme value :
(A) S. D.
(B) M. D.
(C) Q. D.
(D) Variance
98. Median is that value which :
(A) Divides the series in two parts
(B) Divides the series in eight parts
(C) Divides the series in ten parts
(D) Divides the series in hundred parts
99. The algebraic sum of the deviations about mean is :
(A) Minimum
(B) Maximum
(C) Zero
(D) None of these
100. The idea of posteriori probabilities was introduced by :
(A) Pascal
(B) Peter and Paul
(C) Thomas Bayes
(D) None of these

Rough Work / रफ कार्य

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