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प्रश्नपुस्तिका क्रमांक
Question Booklet No.

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प्रश्नपुस्तिका सीरीज
Question Booklet Series

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B.C.A.(Third Semester) Examination, February/March-2022

BCA-305(N)

Elements of Statistics

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 भरे, 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।

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1. The range represents the :
 - (A) Difference between highest and lowest value
 - (B) Middle number
 - (C) Highest number
 - (D) Lowest number
2. If the minimum value in a set is 9 and its range is 57 the maximum value of the set is :
 - (A) 33
 - (B) 66
 - (C) 48
 - (D) None of these
3. The range of the following set of observations 2, 3, 5, 9, 8, 7, 6, 5, 7, 4, 3 is ?
 - (A) 6
 - (B) 7
 - (C) 5.5
 - (D) 11
4. Which of the following is a not a measure of dispersion :
 - (A) Variance
 - (B) Mean deviation
 - (C) Standard deviation
 - (D) Mode

5. Mean deviation can be calculated by using :
- (A) Mean
 - (B) Median
 - (C) Mode
 - (D) All of these
6. If the first quartile is 104 and quartile deviation is 8, the third quartile is :
- (A) 130
 - (B) 120
 - (C) 136
 - (D) 146
7. What would happen to the variance of a data set if we added 5 to every observation ?
- (A) Variance increased by 5
 - (B) Variance decreased by 5
 - (C) No change
 - (D) Variance decreased by 10
8. If weight of six men are 45 kg, 60 kg, 55 kg, 60 kg, 65 kg, 75 kg then arithmetic mean of their weight is :
- (A) 55 kg
 - (B) 65 kg
 - (C) 60 kg
 - (D) 60.5 kg
9. In a moderately symmetric distribution Mean, Median and Mode are connected by :
- (A) $\text{Mode} = 2 \text{ Median} - 3 \text{ Mean}$
 - (B) $\text{Mode} = 3 \text{ Median} - 4 \text{ Mean}$
 - (C) $\text{Mode} = 3 \text{ Median} - 2 \text{ Mean}$
 - (D) $\text{Mode} = 2 \text{ Median} - \text{Mean}$

10. What is the geometric mean of 4, 8 and 16 is :
- (A) 16
 - (B) 8
 - (C) 4
 - (D) None of these
11. What is the mode of the following numbers ?
12, 11, 14, 10, 11, 8, 11, 9
- (A) 11
 - (B) 10
 - (C) 14
 - (D) 8
12. Find the median of the data set: 6, 3, 8, 2, 9, 1 ?
- (A) 4.5
 - (B) 3
 - (C) 6
 - (D) 5
13. The Arithmetic mean of 10 items is 4 and the Arithmetic mean of 5 items is 10 the combined mean of 15 items is :
- (A) 4
 - (B) 5
 - (C) 6
 - (D) 90
14. We must arrange the data before calculating :
- (A) Mean
 - (B) Median
 - (C) Mode
 - (D) Geometric Mean

15. The number of observations are 11 and the value of arithmetic mean is 19, then sum of all values is :
(A) 209
(B) 30
(C) 8
(D) 173
16. The geometric mean and harmonic mean of two values 8 and 16 respectively, then arithmetic mean of value is :
(A) 4
(B) 16
(C) 64
(D) 128
17. Following are the Relative measures of dispersion expect :
(A) Coefficient of Mean deviation
(B) Standard deviation
(C) Coefficient of range
(D) Coefficient of quartile deviation
18. If the height of 5 persons are 144 cm, 152 cm, 151 cm, 158 cm and 155 cm respectively then the mean height is :
(A) 155 cm
(B) 150 cm
(C) 148 cm
(D) 152 cm
19. The median of 2, 3, 10, 5, 7, 20, 6, 11 is :
(A) 10
(B) 5
(C) 5.5
(D) 6.5

20. What is the median of the sample 5, 5, 11, 9, 8, 5, 8 ?
- (A) 5
 - (B) 6
 - (C) 8
 - (D) 9
21. If the Arithmetic mean of a set of two observations is 9 and its geometric mean is 6 then the harmonic mean of the set of observation is :
- (A) 4
 - (B) 36
 - (C) 12
 - (D) 1.5
22. Relationship among the averages :
- (A) $H.M. \geq G.M. \geq A.M.$
 - (B) $A.M. \geq G.M. \geq H.M.$
 - (C) $H.M. \leq A.M. \leq G.M.$
 - (D) $A.M. \geq H.M. \leq G.M.$
23. Harmonic mean cannot be calculated for the data having :
- (A) Positive
 - (B) Negative
 - (C) Zero
 - (D) All of the above

24. Harmonic mean is the reciprocal of :

- (A) Arithmetic mean
- (B) Mode
- (C) Geometric mean
- (D) Median

25. Below are the of the marks of a student. What is the value of mode ?

84, 85, 89, 92, 93, 89, 87, 89, 92 ?

- (A) 92
- (B) 85
- (C) 93
- (D) 89

26. For the following distribution :

Marks	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25
No. of Students	3	8	12	20	7

The lower limit of the modal class is :

- (A) 10
- (B) 15
- (C) 5
- (D) 20

27. The algebraic sum of the deviations of a frequency distribution from its mean is always :

- (A) Greater than zero
- (B) Less than zero
- (C) A non-zero number
- (D) Zero

28. Mode is the :

- (A) Middle most frequent value
- (B) Least frequent value
- (C) Maximum frequent value
- (D) None of these

29. Mode of a distribution can be obtained from :

- (A) Histogram
- (B) Less than type ogive
- (C) More than type ogive
- (D) Frequency polygon

30. Which of the following is not a measure of Central tendency :

- (A) Mean
- (B) Median
- (C) Mode
- (D) Standard deviation

31. For the following distribution :

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
No. of Students	3	9	13	10	5

The number of students who got marks less than 30 is :

- (A) 13
- (B) 25
- (C) 10
- (D) 12

32. In Inclusive class intervals of a frequency distribution :
- (A) Upper limit of each class-interval is included
 - (B) Lower limit of each class-interval is included
 - (C) Both (A) and (B)
 - (D) None of these
33. In Statistics, the Classification includes data according to the time period in which the items under consideration occurred :
- (A) Geographical
 - (B) Chronological
 - (C) Topological
 - (D) None of these
34. The class marks of a distribution are 26, 31, 36, 41, 46 and 51, then the first class interval is :
- (A) $23.5 - 28.5$
 - (B) $23 - 28$
 - (C) $20 - 30$
 - (D) None of these
35. The upper limit of the class-interval is considered for calculating :
- (A) 'Less than' cumulative frequency
 - (B) 'More than' cumulative frequency
 - (C) Relative frequency
 - (D) None of these

36. Class interval is measured as :
- (A) The difference between upper and lower limit
 - (B) The sum of the upper and lower limit
 - (C) Half of the sum of lower and upper limit
 - (D) None of these
37. The aggregate of all the units for pertaining to a study is called :
- (A) Fame
 - (B) Unit
 - (C) Sample
 - (D) Population or universe
38. The data given as 5, 7, 12, 17, 79, 84, 96 will be called :
- (A) A continuous series
 - (B) A discrete series
 - (C) Time series
 - (D) An individual series
39. The number of classes depends upon :
- (A) Frequency
 - (B) Class Interval
 - (C) Class boundary
 - (D) None of these
40. A frequency distribution that contains a class with limit of "20 and 30" would have a midpoint :
- (A) 25
 - (B) 29.5
 - (C) 21
 - (D) 30

41. When successive midpoints in a histogram are connected by straight lines, the graph is called a :
- (A) Histogram
 - (B) Ogive
 - (C) Frequency polygon
 - (D) Pie – Diagram
42. A grouping of data into mutually exclusive classes showing the number of observation in each class is called :
- (A) Frequency polygon
 - (B) Relative Frequency
 - (C) Frequency distribution
 - (D) Cumulative Frequency
43. The class boundaries can be taken when the nature of variable :
- (A) Discrete
 - (B) Continuous
 - (C) Both (A) and (B)
 - (D) None of these
44. The number of observations in a particular class is called :
- (A) Width of the class
 - (B) Class mark
 - (C) Frequency
 - (D) None of these
45. The classification of data according to location is what classification.
- (A) Chronological
 - (B) Quantitative
 - (C) Qualitative
 - (D) Geographical

46. The number of tally sheet count for each value or a group is called :
(A) Class interval
(B) Class limit
(C) Class boundary
(D) Frequency
47. A graph of cumulative frequency distribution is called :
(A) Histogram
(B) Frequency polygon
(C) Ogive
(D) None of the above
48. The data which have already been collected by someone are called :
(A) Raw data
(B) Array data
(C) Secondary data
(D) None of these
49. Primary data is same as :
(A) Group data
(B) Secondary data
(C) Ungrouped data
(D) None of these
50. Data originally collected in the process of Investigation are known as :
(A) Secondary data
(B) Primary data
(C) Third data
(D) None of these

51. R-chart are control charts for :
 (A) Variables
 (B) Reliability
 (C) Attributes
 (D) None of these
52. Statistical quality control techniques are based on the theory of :
 (A) Probability
 (B) Quality
 (C) Statistics
 (D) Set theory
53. Statistical quality control methods are extensively used in the industrial production process because of :
 (A) Reduction in cost
 (B) Greater efficiency
 (C) Timely detection of faults
 (D) All of the above
54. Upper control limit for a $\bar{X}$ - chart is expressed by :
 (A) $\bar{\bar{X}} + A_2\bar{R}$
 (B) $\bar{\bar{X}} - A_2\bar{R}$
 (C) $\bar{\bar{X}} + A_3\bar{R}$
 (D) None of these
55. Mean ($\bar{X}$) chart is a :
 (A) Attribute control chart
 (B) Variable control chart
 (C) Neither a variable control chart nor an Attribute
 (D) None of the above
56. LCL for the R - chart is given by :
 (A) $D_3\bar{R}$
 (B) $\bar{R} - D_3\bar{R}$
 (C) $d_3\bar{R}$
 (D) None of these

57. The control chart used for the fraction of defective items in a sample is :
 (A) Range chart
 (B) Mean chart
 (C) p - chart
 (D) None of these
58. If a sample drawn from the process lies inside the upper control limit and lower control limit, it means the :
 (A) Process is in control
 (B) Process is out of control
 (C) Process is partially in control
 (D) Process is partially out of control
59. The highest value that a quality characteristic can take before the process becomes out of control is called :
 (A) Centre line
 (B) Control limit
 (C) Lower control limit
 (D) Upper control limits
60. Control chart consists of :
 (A) Three control lines
 (B) Level of the process
 (C) Upper and lower control limit
 (D) All of the above
61. Which among the following is a type of chart for variable ?
 (A) c - chart
 (B) $\bar{p}$ - chart
 (C) np - chart
 (D) $\bar{X}$ - chart
62. If the $p = 0.231$ for a np -chart and the number of items in a sample are 50, what be the centre line value of the np -chart ?
 (A) 11.55
 (B) 10.43
 (C) 14.21
 (D) None of these

63. Three books of different colours are to be arranged in a book-shelf. The possible arrangements are :
- (A) 3
(B) 1
(C) 6
(D) 2
64. If two dice are rolled, the numbers of possible outcomes are :
- (A) 6
(B) 36
(C) 1
(D) None of these
65. If A and B are two mutually exclusive events, then :
- (A) $P(A \cup B) = P(A) \cdot P(B)$
(B) $P(A \cup B) = P(A) + P(B)$
(C) $P(A \cap B) = P(A) \cdot P(B)$
(D) $P(A \cap B) = P(A) + P(B)$
66. If $P\left(\frac{B}{A}\right) = 0.50$ and $P(A \cap B) = 0.40$, then $P(A)$ will be equal to :
- (A) 0.40
(B) 0.50
(C) 0.80
(D) 1
67. Two dice are thrown simultaneously, the probability of getting a sum of 9 is :
- (A) $\frac{1}{10}$
(B) $\frac{3}{10}$
(C) $\frac{1}{9}$
(D) $\frac{4}{9}$

8. Given $P(A) = 0.4$, $P(B) = 0.5$ and $P(A \cup B) = 0.9$, then :
- (A) A and B are not mutually exclusive events
 - (B) A and B are equally likely events
 - (C) A and B are independent events
 - (D) A and B are mutually exclusive events
69. The probability of drawing any one spade card is :
- (A) $\frac{1}{13}$
 - (B) $\frac{1}{4}$
 - (C) $\frac{4}{13}$
 - (D) $\frac{1}{52}$
70. If A and B is independent events, then :
- (A) $P(A \cup B) = P(A) \cdot P(B)$
 - (B) $P(A \cup B) = P(A) + P(B)$
 - (C) $P(A) = P(B)$
 - (D) $P(A \cap B) = P(A) \cdot P(B)$
71. When two coins are tossed, the number of possible outcomes are ?
- (A) 2
 - (B) 4
 - (C) 1
 - (D) None of these
72. When the occurrence of one event has no effect on the probability of the occurrence of another event, the events are called ?
- (A) Mutually exclusive
 - (B) Dependent
 - (C) Equally likely
 - (D) Independent

73. A balance die is rolled, the probability of getting an odd number is :
- (A) $\frac{1}{2}$
 - (B) $\frac{1}{4}$
 - (C) $\frac{1}{6}$
 - (D) $\frac{1}{36}$
74. If $A \subset B$ and $B \subset A$, then :
- (A) $P(A) > P(B)$
 - (B) $P(A) < P(B)$
 - (C) $P(A) = P(B)$
 - (D) $P(A) \leq P(B)$
75. Probability lies between :
- (A) -1 and 1
 - (B) 0 and 1
 - (C) 0 and n
 - (D) -1 and 0
76. What is the probability of an impossible event ?
- (A) 0
 - (B) 1
 - (C) Not defined
 - (D) Insufficient data
77. Three cards are selected at random from a pack of 52 cards with replacement. The possible combinations are :
- (A) 52
 - (B) $(52)^3$
 - (C) $(3)^{52}$
 - (D) None of these

What is the probability that when a fair coin is tossed 2 times then at least one of them are heads ?

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

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

(C) $\frac{3}{4}$

(D) 1

79. Which of the following cannot be taken as Probability of an event ?

(A) 0

(B) 0.5

(C) 1

(D) -1

80. A coin is tossed twice. The probability of getting both heads is :

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

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

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

(D) 1

81. A bag containing tickets numbered from 1 to 40. The probability that the selected ticket has a number which is a multiple of 5 is :

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

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

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

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

82. A bag contains 3 red balls and 5 black balls. A ball is drawn at random from bag. The probability that a red ball drawn is :
- (A) $\frac{3}{8}$
(B) $\frac{1}{2}$
(C) $\frac{5}{8}$
(D) $\frac{3}{4}$
83. The number of different permutations of the word 'BANANA' :
- (A) 720
(B) 60
(C) 120
(D) 360
84. How many permutations of the letter of the word 'APPLE' are there ?
- (A) 600
(B) 120
(C) 240
(D) 60
85. How many words can be formed with the letter of the word 'POSTMAN', if every word begins with T and ends with M ?
- (A) 60
(B) 720
(C) 360
(D) 120

86. How many different 3 digit numbers can be formed using number 6, 1, 2, 3 without repetition ?

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

87. The number of ways in which 5 men and 3 women are to be seated at a round table.

So that no two women are to sit together :

- (A) $5! \times {}^5P_3$
- (B) $4! \times {}^5P_3$
- (C) $4! \times {}^6P_3$
- (D) None of these

88. ${}^8P_8 =$

- (A) 0
- (B) 1
- (C) 7!
- (D) 8!

89. $0! =$

- (A) Not exist
- (B) 1
- (C) n
- (D) 0

90. The mode of a distribution is 24 and the mean is 60. What is its median ?

- (A) 48
- (B) 50
- (C) 45
- (D) 51

91. In how many ways 4 boys and 3 girls can be seated in a row, so that they are alternate :
- (A) 144
(B) 288
(C) 12
(D) 256
92. If 3 candidates are selected from the 10 candidates, the number of ways of selecting the candidates is an example of :
- (A) Combination
(B) Permutation
(C) Reduced sample space.
(D) Both (A) and (B)
93. In how many ways can we select 6 people out of 10 of which a particular person is not included ?
- (A) $^{10}C_3$
(B) $^9C_5$
(C) $^9C_6$
(D) $^9C_4$
94. The number of permutations of a set of n things, taken r at a time is given by :
- (A) $\frac{n!}{(n-r)!}$
(B) $\frac{n!}{(r-n)!}$
(C) $\frac{n!}{r!(n-r)!}$
(D) $\frac{n!}{r!}$
95. In how many ways 2 students can be chosen from the class of 20 students :
- (A) 190
(B) 180
(C) 240
(D) 390

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