

Roll No. ....

Question Booklet Number

O. M. R. Serial No.

--	--	--	--	--	--	--	--

## B. Com. (Honors) (Second Semester)

### EXAMINATION, July, 2022

#### STATISTICAL METHODS

##### Paper Code

BCOMH	2	0	0	1
-------	---	---	---	---

Questions Booklet  
Series

D

Time : 1:30 Hours ]

[ Maximum Marks : 100

##### Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer any 75 questions in the OMR Answer-Sheet provided and not in the question booklet. If more than 75 questions are attempted by student, then the first attempted 75 questions will be considered for evaluation. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.

##### परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को किन्हीं 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। यदि छात्र द्वारा 75 से अधिक प्रश्नों को हल किया जाता है तो प्रारम्भिक हल किये हुए 75 उत्तरों को ही मूल्यांकन हेतु सम्मिलित किया जाएगा। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

(Remaining instructions on the last page)

(शेष निर्देश अन्तिम पृष्ठ पर)

***(Only for Rough Work)***

1. What is the median of the data 78, 56, 22, 34, 45, 54, 39, 68, 54, 84 ?  
 (A) 54  
 (B) 53  
 (C) 55  
 (D) 51
2. The measure of dispersion can never be :  
 (A) Positive  
 (B) Negative  
 (C) 0  
 (D) 1
3. The sum of squared deviations of a set of  $n$  values from their mean is :  
 (A) Zero  
 (B) Maximum  
 (C) Least  
 (D) None of the above
4. In regression analysis, if the independent variable is measured in kilograms, the dependent variable :  
 (A) must also be in kilograms  
 (B) must be in some unit of weight  
 (C) cannot be in kilograms  
 (D) can be any units
5. The mean or average used to measure central tendency is called :  
 (A) sample mean  
 (B) arithmetic mean  
 (C) negative mean  
 (D) population mean
6. If the mean of percentages, rates and ratios is to be calculated, then the central tendency measure which must be used in this situation is :  
 (A) weighted arithmetic mean  
 (B) paired arithmetic mean  
 (C) non-paired arithmetic mean  
 (D) square of arithmetic mean
7. In the quartiles, the central tendency median to be measured must lie in :  
 (A) first quartile  
 (B) second quartile  
 (C) third quartile  
 (D) four quartile
8. The strength (degree) of the correlation between a set of independent variables  $X$  and a dependent variable  $Y$  is measured by :  
 (A) Coefficient of correlation  
 (B) Coefficient of determination  
 (C) Standard error of estimate  
 (D) All of the above
9. The percent of total variation of the dependent variable  $Y$  explained by the set of independent variables  $X$  is measured by :  
 (A) Coefficient of correlation  
 (B) Coefficient of skewness  
 (C) Coefficient of determination  
 (D) Standard error

10. \_\_\_\_\_ is particularly suitable for the construction of index nos.
- (A) H.M.  
(B) A.M.  
(C) G.M.  
(D) None of the above
11. Find the mean of  $x + 77$ ,  $x + 7$ ,  $x + 5$ ,  $x + 3$  and  $x - 2$  ?
- (A)  $x + 8$   
(B)  $x + 18$   
(C)  $x - 8$   
(D)  $x - 18$
12. The measure of dispersion is changed by a change of :
- (A) Origin  
(B) Scale  
(C) Algebraic signs  
(D) None of the above
13. The standard deviation is always \_\_\_\_\_ than the mean deviation.
- (A) Greater  
(B) Less  
(C) Equal  
(D) None of the above
14. A dice is thrown. The probability of getting 1 and 5 is :
- (A)  $1/6$   
(B)  $2/3$   
(C)  $1/3$   
(D)  $1/2$
15. A batsman hits boundaries for 6 times out of 30 balls. Find the probability that he did not hit the boundaries :
- (A)  $1/5$   
(B)  $2/5$   
(C)  $3/5$   
(D)  $4/5$
16. The probability of each event lies between :
- (A) 1 and 2  
(B) 1 and 10  
(C) 0 and 1  
(D) 0 and 5
17. A series of numerical figures which show the relative position is called :
- (A) index no.  
(B) relative no.  
(C) absolute no.  
(D) None of the above
18. The range of the scores 29, 3, 143, 27, 99 is :
- (A) 140  
(B) 143  
(C) 146  
(D) 70

19. If an event cannot occur, then its probability is :
- (A) 1  
(B)  $\frac{3}{4}$   
(C)  $\frac{1}{2}$   
(D) 0
20. Index nos. show changes rather than absolute amounts of change :
- (A) Relative  
(B) Percentage  
(C) Both (A) and (B)  
(D) None of the above
21. In Statistics out of 100, marks of 21 students in final exams are as 90, 95, 95, 94, 90, 85, 84, 83, 85, 81, 92, 93, 82, 78, 79, 81, 80, 82, 85, 76, 85, then mode of data is :
- (A) 85  
(B) 95  
(C) 90  
(D) 81
22. If two dice are thrown in the air, then probability of getting sum as 3 will be :
- (A)  $\frac{2}{18}$   
(B)  $\frac{3}{18}$   
(C)  $\frac{1}{18}$   
(D)  $\frac{1}{36}$
23. The ratio of price of single commodity in a given period to its price in another period is called the :
- (A) base period  
(B) price ratio  
(C) relative price  
(D) None of the above
24. If mean is less than mode, then distribution will be :
- (A) Positively skewed  
(B) Negatively skewed  
(C) Symmetrical  
(D) None of the above
25. The shape of symmetrical distribution is \_\_\_\_\_.
- (A) U-shaped  
(B) Bell-shaped  
(C) J-shaped  
(D) None of the above

26. The algebraic sum of deviations from mean is :
- (A) Maximum
  - (B) Zero
  - (C) Minimum
  - (D) Undefined
27. Statistics is a numerical quantity, which is calculated from :
- (A) Population
  - (B) Sample
  - (C) Data
  - (D) Observations
28. What is the median of 33, 86, 68, 32, 80, 48, 70 ?
- (A) 32
  - (B) 68
  - (C) 80
  - (D) 86
29. In a moderately skewed distribution, the value of mean is 16 and that of mode is 25. What will be the value of median ?
- (A) 20
  - (B) 19
  - (C) 21
  - (D) None of the above
30. For a symmetrical distribution,  $Q_1$  and  $Q_3$  are 20 and 60 respectively. The value of median will be :
- (A) 20
  - (B) 30
  - (C) 40
  - (D) 50
31. From which average, the sum of deviations is zero ?
- (A) Mean
  - (B) Median
  - (C) Mode
  - (D) None of the above
32. In statistics, a sample means :
- (A) A portion of the sample
  - (B) A portion of the population
  - (C) All the items under investigation
  - (D) None of the above
33. If there is no gap between the consecutive classes, the limits are called :
- (A) Class limits
  - (B) Class boundaries
  - (C) Class intervals
  - (D) Class marks

34. If the arithmetic mean is multiplied to coefficient of variation, then the resulting value is classified as :
- (A) coefficient of deviation
  - (B) coefficient of mean
  - (C) standard deviation
  - (D) variance
35. If mean absolute deviation of set of observations is 8.5, then the value of quartile deviation is :
- (A) 7.08
  - (B) 9.08
  - (C) 10.2
  - (D) 11.2
36. For a positively skewed distribution, mean is always :
- (A) Less than the median
  - (B) Less than the mode
  - (C) Greater than the mode
  - (D) Difficult to tell
37. In inferential statistics, we study :
- (A) The methods to make decisions about the population based on sample results.
  - (B) How to make decisions about mean, median or mode.
  - (C) How a sample is obtained from a population.
  - (D) None of the above
38. The data which have not undergone any statistical treatments are :
- (A) Primary data
  - (B) Secondary data
  - (C) Discrete data
  - (D) Continuous data
39. If the sum of deviations from median is not zero, then a distribution will be :
- (A) Symmetrical
  - (B) Skewed
  - (C) Normal
  - (D) All of the above
40. The degree of peakedness or flatness of a unimodal distribution is called :
- (A) Skewness
  - (B) Symmetry
  - (C) Dispersion
  - (D) Kurtosis
41. Data in the Population Census Report is :
- (A) Grouped data
  - (B) Ungrouped data
  - (C) Secondary data
  - (D) Primary data

42. The average to be used to determine the average size of the shoe sold in a shop is :
- Mean
  - Median
  - Mode
  - None of the above
43. Find the mode of 5, 3, 27, 5, 9, 3, 8, 5 :
- 5
  - 27
  - 9
  - 3
44. The mean is affected by the change of \_\_\_\_\_.
- Origin
  - Scale
  - Both origin and scale
  - Units
45. In a mesokurtic or normal distribution,  $\mu_4 = 243$ . The standard deviation is :
- 81
  - 27
  - 9
  - 3
46. In a symmetrical distribution,  $Q_3 - Q_1 = 20$ , median = 15.  $Q_3$  is equal to :
- 5
  - 15
  - 20
  - 25
47. The first 3 moments of a distribution about the mean are 1, 4 and 0. The distribution is :
- Symmetrical
  - Skewed to the left
  - Skewed to the right
  - Normal
48. In statistics, conducting a survey means :
- Collecting information from elements
  - Making mathematical calculations
  - Drawing graphs and pictures
  - None of the above
49. In a moderately asymmetrical distribution, the value of mean is 75 and the value of mode is 60. What will be the value of median ?
- 75
  - 70
  - 85
  - 80
50. Given Mean = 70.2 and Mode = 70.5. Find the Median using empirical relationship among them :
- 120
  - 150
  - 180
  - 300



51. When data are collected in a statistical study for only a portion or subset of all elements of interest we are using :
- (A) A sample
  - (B) A parameter
  - (C) A population
  - (D) Both (B) and (C)
52. For a symmetrical distribution :
- (A)  $\beta_1 > 0$
  - (B)  $\beta_1 < 0$
  - (C)  $\beta_1 = 0$
  - (D)  $\beta_1 = 3$
53. The second and fourth moments about mean are 4 and 48 respectively, then the distribution is :
- (A) Leptokurtic
  - (B) Platykurtic
  - (C) Mesokurtic or normal
  - (D) Positively skewed
54. If any value in a series is zero, then we cannot compute the \_\_\_\_\_.
- (A) Mean
  - (B) Median
  - (C) Mode
  - (D) Geometric Mean
55. The height of a student is 60 inches. This is an example of :
- (A) Qualitative data
  - (B) Categorical data
  - (C) Continuous data
  - (D) Discrete data
56. Bowley's coefficient of skewness lies between :
- (A) 0 and 1
  - (B) 1 and + 1
  - (C) - 1 and 0
  - (D) - 2 and + 2
57. A card is drawn from the set of 52 cards. Find the probability of getting a queen card :
- (A)  $1/26$
  - (B)  $1/13$
  - (C)  $4/53$
  - (D)  $4/13$
58. Which one of the following measurements does not divide a set of observations into equal parts ?
- (A) Quartiles
  - (B) Standard Deviations
  - (C) Percentiles
  - (D) Deciles

59. Which one is not the measure of dispersion ?
- (A) The Range
  - (B) 50th Percentile
  - (C) Inter-quartile Range
  - (D) Variance
60. In a moderately skewed distribution, the value of mode is 120 and that of median is 140. Find the value of arithmetic mean :
- (A) 150
  - (B) 160
  - (C) 170
  - (D) 180
61. The arithmetic mean of the marks obtained by 50 students was calculated as 44. It was later discovered that a score of 36 was misread as 56. Find the correct value of arithmetic mean of the marks obtained by the students :
- (A) 43
  - (B) 43.6
  - (C) 45
  - (D) 50
62. Half of the difference between upper and lower quartiles is called :
- (A) Interquartile range
  - (B) Quartile deviation
  - (C) Mean deviation
  - (D) Standard deviation
63. If  $Q_3 = 20$  and  $Q_1 = 10$ , the coefficient of quartile deviation is :
- (A) 3
  - (B)  $1/3$
  - (C)  $2/3$
  - (D) 1
64. If the quartile range is 24, then the quartile deviation is :
- (A) 48
  - (B) 12
  - (C) 24
  - (D) 72
65. The sum of all the squared deviations is divided by the total number of observations to calculate :
- (A) population deviation
  - (B) population variance
  - (C) sample deviation
  - (D) sample variance

66. If the sum of squares of the rank differences of 10 pairs of values is 30, find the correlation coefficient between them :
- (A) 0.75  
(B) 0.82  
(C) 0.90  
(D) 0.83
67. The measure of dispersion which uses only two observations is called :
- (A) Range  
(B) Quartile deviation  
(C) Mean deviation  
(D) Standard deviation
68. In a bivariate sample, the sum of squares of differences between marks of observed values of two variables is 33 and the rank correlation between them is 0.8. Find the number of pairs of observations :
- (A) 12  
(B) 10  
(C) 15  
(D) 18
69. In a bivariate distribution, Spearman's coefficient of correlation is  $-0.25$ . If the sum of the squares of various ranks is 150, find out the number of pairs of items :
- (A) 10  
(B) 8  
(C) 9  
(D) 7
70. For the recorded observation, the ratios measured by absolute variation are considered as :
- (A) non-relative measures  
(B) relative measures  
(C) high uniform measures  
(D) low uniform measures
71. Variance remains unchanged by the change of :
- (A) Origin  
(B) Scale  
(C) Both origin and scale  
(D) None of the above

72. The rank correlation coefficient of a debating contest involving 10 participants was calculated as 0.6. However, it was later discovered that the difference in the ranks of some participants was read as 8 instead of 3. Find the correct correlation coefficient :
- (A) 0.933  
(B) 0.652  
(C) 0.854  
(D) 0.751
73. If  $Y = -8X - 5$  and S.D. of X is 3, then S.D. of Y is :
- (A) 8  
(B) 3  
(C) 5  
(D) 24
74. The regression coefficient of X on Y is :
- (A)  $b_{XY}$   
(B)  $b_{YX}$   
(C) Not specified  
(D) None of the above
75. Regression coefficient of Y on X is :
- (A)  $b_{XY}$   
(B)  $b_{YX}$   
(C) Not specified  
(D) None of the above
76. If one of the regression coefficients is greater than unity, the other must be :
- (A) More than unity  
(B) Less than unity  
(C) Unity  
(D) None of the above
77. Standard deviation is calculated from the Harmonic Mean (HM) :
- (A) Always  
(B) Sometimes  
(C) Never  
(D) None of the above
78. Suppose for 40 observations, the variance is 50. If all the observations are increased by 20, the variance of these increased observations will be :
- (A) 50  
(B) 70  
(C) 50/20  
(D)  $50 - 20 = 30$
79. The variance of 5 numbers is 10. If each number is divided by 2, then the variance of new number is :
- (A) 20  
(B) 5  
(C) 2.5  
(D) 5.5

80. The regression coefficients are independent of change of origin but :
- (A) Not of scale
  - (B) Also of scale
  - (C) No change in scale
  - (D) None of the above
81. The coefficient of correlation between the regression coefficients is :
- (A) Arithmetic Mean
  - (B) Geometric Mean
  - (C) Average
  - (D) None of the above
82. The correlation coefficient is used to determine :
- (A) A specific value of the  $y$ -variable given a specific value of the  $x$ -variable
  - (B) A specific value of the  $x$ -variable given a specific value of the  $y$ -variable
  - (C) The strength of the relationship between the  $x$  and  $y$ -variables
  - (D) None of the above
83. The lowest value of variance can be :
- (A) 1
  - (B)  $-1$
  - (C) 0
  - (D)  $-3$
84. The marks obtained by 9 students in a test are 25, 20, 15, 45, 18, 7, 10, 38 and 12. Find the median :
- (A) 38
  - (B) 20
  - (C) 18
  - (D) 15
85. In a moderately asymmetrical distribution, the mode and mean are 32.1 and 35.4 respectively. Calculate the median :
- (A) 35
  - (B) 34.3
  - (C) 36
  - (D) 37
86. If there is a very strong correlation between two variables, then the correlation coefficient must be :
- (A) any value larger than 1.
  - (B) much smaller than 0, if the correlation is negative.
  - (C) much larger than 0, regardless of whether the correlation is negative or positive.
  - (D) None of the above alternatives is correct.

87. In regression, the equation that describes how the response variable ( $y$ ) is related to the explanatory variable ( $x$ ) is :
- the correlation model
  - the regression model
  - used to compute the correlation coefficient
  - None of the above
88. In regression analysis, the variable that is being predicted is the :
- response or dependent variable
  - independent variable
  - intervening variable
  - is usually  $x$
89. In a moderately skewed distribution, the mode and median are 20 and 24 respectively. Calculate the value of mean :
- 27
  - 26
  - 25
  - 28
90. The mean weight of 150 students in a class is 60 kg. The mean weight of boy students is 70 kg and that of girl students is 55 kg. Find the number of boys and girls in the class :
- 50 and 100
  - 100 and 50
  - 150 and 200
  - 200 and 150
91. In regression analysis, the variable that is used to explain the change in the outcome of an experiment or some natural process, is called :
- the  $x$ -variable
  - the independent variable
  - the predictor variable
  - the explanatory variable
92. If the coefficient of determination is a positive value, then the regression equation :
- must have a positive slope
  - must have a negative slope
  - could have either a positive or a negative slope
  - must have a positive  $y$  intercept
93. A distribution consists of three components with total frequencies of 200, 250 and 300 having means 25, 10 and 15 respectively. Find the mean of the combined distribution :
- 17
  - 16
  - 15
  - 20

94. The percentage of values lies between  $X \pm 2$  S.D. is :
- (A) 68.26%
  - (B) 95.45%
  - (C) 99.7%
  - (D) 65%
95. The sum of squares of deviation is least if measure from :
- (A) Mean
  - (B) Mode
  - (C) Median
  - (D) Variance
96. If two variables  $x$  and  $y$ , have a very strong linear relationship, then :
- (A) there is evidence that  $x$  causes a change in  $y$ .
  - (B) there is evidence that  $y$  causes a change in  $x$ .
  - (C) there might not be any causal relationship between  $x$  and  $y$ .
  - (D) None of the above alternatives is correct.
97. If the coefficient of determination is equal to 1, then the correlation coefficient :
- (A) must also be equal to 1
  - (B) can be either  $-1$  or  $+1$
  - (C) can be any value between  $-1$  to  $+1$
  - (D) must be  $-1$
98. Variance is always calculated from :
- (A) Mode
  - (B) Variance
  - (C) Mean
  - (D) Median
99. The arithmetic mean is 12 and the number of observations is 20, then the sum of all the values is :
- (A) 8
  - (B) 32
  - (C) 240
  - (D) 1.667
100. The method used to compute average or central value of the collected data is considered as :
- (A) measures of positive variation
  - (B) measures of central tendency
  - (C) measures of negative skewness
  - (D) measures of negative variation

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the most correct/appropriate answer and mark the same in the OMR Answer-Sheet as per the direction :

**Example :**

**Question :**

Q. 1 (A) ☒ (B) (C) (D)

Q. 2 (A) (B) ☒ (C) (D)

Q. 3 (A) ☒ (B) (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
6. All answers are to be given on OMR Answer sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.
7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.
8. After the completion of the examination candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.
9. There will be no negative marking.
10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
11. To bring and use of log-book, calculator, pager and cellular phone in examination hall is prohibited.
12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

**Impt. :** On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर—A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से एक सबसे सही अथवा सबसे उपयुक्त उत्तर छोटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ☒ (B) (C) (D)

प्रश्न 2 (A) (B) ☒ (C) (D)

प्रश्न 3 (A) ☒ (B) (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
6. सभी उत्तर केवल ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
7. ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।
9. निगेटिव मार्किंग नहीं है।
10. कोई भी रफ कार्य, प्रश्न-पुस्तिका के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

**महत्वपूर्ण :** प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।