(ii) **Questions** : 9   **Sub. Code :** | 0 | 9 | 1 | 2 |

Exam. Code : | 0 | 0 | 2 | 7 |

Bachelor of Computer Applications 1ˢᵗ Semester

(2123)

FUNDAMENTALS OF MATHEMATICAL STATISTICS

Paper : BCA-16-102

Time Allowed : Three Hours]   **[Maximum Marks : 65**

Note :—Attempt **FIVE** questions in all including Question No. **9** (Unit–V) which is compulsory and selecting **ONE** question from each unit I–IV. Use of Non-programmable calculator is allowed.

UNIT—I

1. (a) Define Statistics. Explain the various stages involved in statistical investigation.

    (b) Explain the importance of graphic presentation of statistics. What are the various advantages and defects ?   6,7

2. (a) Differentiate among Arithmetic, Geometric and Harmonic Mean in detail.

(b) The mean actual salaries paid to all employees was Rs. 5,000. The mean actual salaries paid to male and female employees were Rs. 5,200 and Rs. 4,200 respectively. Determine the percentage of males and females employed by the company. 6,7

UNIT—II

3. (a) What do you mean by Partition Values ? In what respect they are different from median ? Explain any three partition values with their formulas.

(b) Calculate the Median, Quartiles and Sixth decile from the data :

Marks less than	80	70	60	50	40	30	20	10
No. of candidates	100	90	80	60	32	20	13	5

6,7

4. (a) Calculate Semi-inter quartile range and Quartile coefficient from the data :

Age (Years)	20	30	40	50	60	70	80
No. of Members	3	61	132	153	140	51	3

(b) Calculate the Standard Deviation of the following two series. Which shows greater variation ?

Series A	192	288	236	229	184	260	348	291	330	243
Series B	83	87	93	109	124	126	126	101	102	108

6,7

UNIT—III

5. (a) What is a Scatter Diagram ? How does it help us in studying the correlation between two variables, in respect of both nature and extent ?

(b) Calculate Karl Pearson's coefficient from the following data :

X	23	27	28	28	29	30	31	33
Y	18	20	20	27	21	29	27	29

6,7

6. (a) Explain probable error, standard error and coefficient of determination.

(b) The following table shows the marks of 12 students in Mathematics and Physics. Find rank correlation coefficient.

Students	Marks in Mathematics	Marks in Physics
A	65	30
B	40	55
C	35	68
D	75	28
E	65	76
F	80	25
G	35	80
H	20	85
I	85	20
J	65	35
K	65	45
L	33	65

6,7

UNIT—IV

7. (a) Explain the method of least squares for estimating the Regression lines.

   (b) The following table shows the age (X) and blood pressure (Y) of 8 persons :

X	52	63	45	36	72	65	47	25
Y	62	53	51	25	79	43	60	33

   Obtain the two regression equations. Also find the expected blood pressure of a person who is 49 years old. 6,7

8. (a) Explain Regression Coefficients and its properties.

   (b) Let $X = 9Y + 11$ and $Y = kX + 6$ be the lines of regression of X on Y and Y on X respectively. Prove that $0 \le 9k \le 1$. If $k = \dfrac{1}{18}$, find the value of correlation coefficient and means of the variables. 6,7

UNIT—V

9. Explain the following :—

   (a) Bivariate Frequency Distribution. 2

   (b) Tabulation of data. 2

   (c) Percentile range. 2

   (d) Dispersion. List two characteristics of a good measure of dispersion. 3

   (e) Objectives of regression analysis. 2

   (f) Rank Correlation. 2