NRT/KS/19/2208

Bachelor of Computer Application (B.C.A.) Semester-I Examination
STATISTICAL METHODS
Paper—III

Time : Three Hours]   [Maximum Marks : 50

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Assume suitable data wherever necessary.

(3) Draw neat and labelled diagrams wherever necessary.

EITHER

1. (a) Write a short note on tabulation of data.   5

   (b) Explain the importance and scope of statistics in detail.   5

   OR

   (c) Define statistics and discuss the cause of distrust of statistics.   5

   (d) Prepare a suitable frequency table of the marks in the subject Statistics obtained by the students from the following data by taking a class interval of 10-15, 15-20, 20-25 etc. :

   11, 18, 25, 27, 16, 29, 30, 20, 26, 12, 25, 28, 19, 13, 30, 22, 23, 29, 30, 36, 22, 25, 27, 14, 30, 31, 21, 34, 20, 37, 23, 27, 36, 32, 19, 35, 34, 33, 32, 40, 42, 15, 41, 38.   5

EITHER

2. (a) Write short notes on :

   (i) Geometric mean

   (ii) Harmonic mean.   5

   (b) Calculate mode for the following data :

Marks	50-55	55-60	60-65	65-70	70-75	75-80
No. of students	3	8	14	20	16	2

   5

   OR

   (c) Explain the different measures of central tendency.   5

   (d) Obtain the median for the following frequency distribution :

x	1	2	3	4	5	6	7	8	9
y	8	10	11	16	20	25	15	9	6

   5

EITHER

3. (a) Explain in brief how the measures of skewness and kurtosis can be used in describing frequency distribution.   5

   (b) Calculate the mean-deviation for the following data :

Quantity demanded (Units)	10	20	30	40	50	60	70	80	90	100
Frequency	7	13	16	6	14	19	28	17	21	9

   5

OR

(c) Define the term dispersion. Explain any two measures of dispersion.   5

(d) Find the standard deviation for the following distribution :

x	4.5	14.5	24.5	34.5	44.5	54.5	64.5
y	5	3	7	18	14	9	4

5

EITHER

4. (a) What is correlation ? Explain the types of correlations.   5

(b) Calculate Karl Pearson coefficient of correlation :

x	42	52	55	60	66	68	65	60	58	34
y	11	13	18	22	26	40	31	27	24	18

5

OR

(c) Calculate coefficient of correlation between the expenses and saving of any family :

Expenses (Rs.)	10	18	27	39	46
Saving (Rs.)	70	55	47	28	20

5

(d) Derive the formula for an angle between two lines of regression.   5

5. (a) Explain primary data and secondary data in brief.   2½

(b) Explain the following :

    (i) Weighted arithmetic mean

    (ii) Relationship between A.M., GM and HM.   2½

(c) What are quartiles ? How are they used for measuring dispersion.   2½

(d) Differentiate between correlation and regression.   2½

NJR/KS/18/3208

Bachelor of Computer Application (B.C.A.) Semester—I (C.B.S.) Examination

STATISTICAL METHODS

Paper—III

Time : Three Hours] [Maximum Marks : 50

Note :— (1) **All** questions are compulsory and carry equal marks.

(2) Assume suitable data wherever necessary.

(3) Draw neat and labelled diagram wherever necessary.

EITHER

1. (a) Explain the meaning of the word 'Statistics' as used in different sense. Discuss the scope of Statistics. 5

   (b) What is lottery method of sampling ? Explain its merits and demerits. 5

   OR

   (c) Explain the different methods of collecting primary data. 5

   (d) How can statistical data be classified ? Explain. 5

EITHER

2. (a) What are the different measures of central tendency ? Explain. 5

   (b) Calculate the mean for the following frequency distribution :

Class Interval	0 – 8	8 – 16	16 – 24	24 – 32	32 – 40	40 – 48
Frequency	8	7	16	24	15	7

   5

   OR

   (c) Derive the median formula for continuous frequency distribution. 5

   (d) Find the simple and weighted arithmetic mean of the first n natural numbers, the weights being the corresponding numbers. 5

EITHER

3. (a) Define the term dispersion. Explain any two measures of dispersion with their merits and demerits. 5

   (b) The first of the two samples, has 100 items with mean 15 and standard deviation 3. If the whole group has 250 items with mean 15.6 and standard deviation $\sqrt{13.44}$, find the standard deviation of the second group. 5

   OR

   (c) Define the following terms :

   (i) Skewness

   (ii) Kurtosis. 5

   (d) Calculate quartile deviation for the following data :

Marks	0–10	10–20	20–30	30–40	40–50	50–60	60–70
No. of students	6	5	8	15	7	6	3

   5

RQA—33113 1 (Contd.)

EITHER

4. (a) Find the angle between two lines of regression :

$$Y - \bar{y} = r \cdot \frac{6y}{6x} \ (X - \bar{x})$$

$$X - \bar{x} = r \cdot \frac{6x}{6y} \ (Y - \bar{y})$$

5

(b) Calculate the coefficient of correlation between X and Y for the following :

X	1	3	4	5	7	8	10
Y	2	6	8	10	14	16	20

5

OR

(c) Find the line of best fit for the following data :

X	1	2	3	4	5
Y	1	2	1.3	3.75	2.25

5

(d) Explain the coefficient of correlation with its limits. 5

5. Attempt **all** :

(a) Discuss the cause of distrust of statistics. 2½

(b) Define the following :

(i) Geometric Mean

(ii) Harmonic Mean. 2½

(c) Give the coefficients of dispersion based on different measures of dispersion. 2½

(d) Give any two properties of Regression Coefficients. 2½

Bachelor of Computer Application (B.C.A.) Semester–I (C.B.S.) Examination

STATISTICAL METHODS

Paper–III

Time : Three Hours]   [Maximum Marks : 50

N.B. :— (1)   **ALL** the questions carry equal marks.

       (2)   Assume the data wherever necessary.

     EITHER

1.   (a)   Explain various functions of Statistics.   5

       (b)   What are the various methods of Sampling ? Explain.   5

     OR

       (c)   Describe the various methods of collection of Statistical Data.   5

       (d)   Write limitations of Statistics.   5

     EITHER

2.   (a)   Define Central Tendency. What are the various measures of central tendencies ? Explain advantages and disadvantages of Arithmetic Mean.   5

       (b)   Find the mode of the following frequency distribution :

Size (x)	Frequency (f)
1	3
2	8
3	15
4	23
5	35
6	40
7	32
8	28
9	20
10	45
11	14
12	6

                                                                             5

OR

(c) Explain graphic representations of Frequency Distribution. 5

(d) Calculate arithmetic mean of marks of following data :

Marks	No. of Students	
0–10	12	
10–20	18	
20–30	27	
30–40	20	
40–50	17	
50–60	6	5

EITHER

3. (a) Prove that for any discrete distribution, standard deviation is not less than mean deviation from mean. 5

(b) Find the coefficient of skewness from the data given below :

Size	3	4	5	6	7	8	9	10	
Frequency	7	10	14	35	102	136	43	8	5

OR

(c) What are the objectives of measuring dispersion of a frequency distribution ? Explain. 5

(d) Calculate quartile deviation and its coefficient from the following data :

Wages	No. of Wages	
0–10	20	
10–20	45	
20–30	85	
30–40	160	
40–50	70	
50–60	55	
60–70	35	
70–80	30	5

EITHER

4. (a) Explain coefficient of correlation with its limits.   5

(b) A random sample of 5 college students is selected and their grades in Mathematics and Statistics are found to be :

Mathematics	85	60	73	40	90
Statistics	93	75	65	50	80

Calculate Rank Correlation Coefficient.   5

OR

(c) What is Regression ? Explain the properties of regression coefficient in detail.   5

(d) Obtain lines of regression for the following :

X	1	2	3	4	5	6	7	8	9
Y	9	8	10	12	11	13	14	16	15

And also obtain an estimate of Y which should correspond to the average X = 6.2.   5

5. Attempt **ALL** :

(a) What is Diagram ? Explain with its different types.   2½

(b) Define Weighted Mean. Under what circumstances would you prefer it to unweighted mean ?   2½

(c) What is Variation ? Discuss coefficient of variation.   2½

(d) What is Scatter Diagram ? Explain.   2½

5. (a) Discuss various definitions of statistics. 2½

(b) What is series ? Discuss the various elements of continuous series. 2½

(c) What are quartiles ? How are they used for measuring dispersion ? 2½

(d) Explain lines of regression. 2½

Bachelor of Computer Applications (B.C.A.)
Semester–I (CBS) Examination
STATISTICAL METHODS
Paper—III

Time—Three Hours] [Maximum Marks—50

N.B. :— (1) **All** the questions carry equal marks.

(2) Assume the data wherever necessary.

EITHER

1. (a) Define census and sampling. Explain methods of sampling. 5

(b) Explain importance and scope of statistics in detail. 5

OR

(c) Explain classification and tabulation of data in detail. 5

(d) Explain various functions of statistics. 5

EITHER

2. (a) A man can take a trip which entails travelling 900 km by train at an average speed of 60 km per hour, 300 km by boat at an average speed of 25 km per hour, 400 km by plane at 350 km per hour and

finally 10 km by taxi at 25 km per hour. What is the average speed for the entire distance ?   5

(b) Define weighted average. State merits and demerits of mode in detail.   5

OR

(c) Write the requisities for an ideal measure of central tendency.   5

(d) Calculate median for the following data :

Marks	Frequency
10-25	6
25-40	20
40-55	44
55-70	26
70-85	3
85-100	1

5

EITHER

3. (a) Calculate mean deviation from the median for the following frequency distribution.

100 150 200 250 360 490 500 600 671   5

(b) What is dispersion ? State merits and demerits of mean deviation.   5

OR

(c) Calculate standard deviation for the data :

Height (cm)	Frequency
60-62	5
63-65	18
66-68	42
69-71	27
72-74	8

5

(d) Explain in brief how the measures of skewness and kurtosis can be used in describing frequency distribution.   5

EITHER

4. (a) What is correlation. Explain types of correlation.   5

(b) Obtain the equations of two lines of regression for data :

X 65 66 67 67 72 69 71 67
Y 67 68 65 68 69 70 69 70   5

OR

(c) Derive the formula for an angle between two lines of regression.   5

(d) Calculate Karl Pearson's coefficient of correlation for the following data :

X 12 9 8 10 11 13 7
Y 14 8 6 9 11 12 3   5

(d) By using the following information, calculate Karl Pearson's Coefficient of Correlation.

X Series	14	16	18	20	24	30	32	
Y Series	52	62	65	?	76	80	78	5

5. Solve any **Ten** :

(a) Write any one feature of Statistics.

(b) Write one valid reason for the distrust of Statistics.

(c) What is an open question ?

(d) Write the relationship between arithmetic mean, harmonic mean and geometric mean.

(e) Define Median.

(f) Define Harmonic Mean.

(g) Write a merit of range.

(h) What is quartile deviation ?

(i) What is the relation between standard deviation and variation ?

(j) Define Simple Correlation.

(k) What is a Scatter diagram ?

(l) Explain the use of regression.　　1×10=10

Bachelor of Computer Application (B.C.A.) Semester–I Examination
STATISTICAL METHODS
Paper—III

Time—Three Hours]　　　　　　[Maximum Marks—50

N.B. :— (1) All questions are compulsory.

(2) Illustrate your answers wherever necessary with the help of neat sketches.

(3) All questions carry equal marks.

EITHER

1. (a) Write in brief the scope of statistics.　　5

(b) Write a short note on tabulation of data.　　5

OR

(c) What is Primary data ? Write the methods of collecting primary data.　　5

(d) The following is monthly savings of 30 families in a Colony. Prepare a suitable frequency table.

Savings	53	44	55	79	56	48	57	67	
	42	97	59	34	51	90	76	54	
	60	55	71	46	49	53	56	61	
	81	51	50	63	71	28			5

EITHER

2. (a) What are the measures of Central Tendency ? Explain any one of the measures in detail.   5

    (b) Calculate mode for the following data :   5

Marks	0-9	10-19	20-29	30-39	40-49
Students	2	10	18	20	38

Marks	50-59	60-69	70-79	80-89	90-99
Students	25	16	10	8	3

OR

    (c) Write short notes on :

        (i) Geometric mean

        (ii) Harmonic mean.   5

    (d) Calculate Arithmetic mean for the following frequency distribution :   5

Class Interval	0-5	5-10	10-15	15-20	20-25
Frequency	15	24	28	40	50

Class Interval	25-30	30-35	35-40	40-45
Frequency	30	25	20	10

EITHER

3. (a) Write the different methods of measuring dispersion.   5

    (b) Calculate standard deviation for the following data :

Marks	10	20	30	40	50	60
No. of Students	2	3	2	3	2	3

                      5

OR

    (c) Write short notes on :

        (i) Skewness

        (ii) Kurtosis.   5

    (d) Calculate Coefficient of variation :

Weights in kg	60-62	63-65	66-68	69-71	72-74
No. of Bulbs	5	18	45	27	8

                      5

EITHER

4. (a) What is Correlation ? What are the different types of Correlations ?   5

    (b) From the following information obtain two regression equations and estimate X when Y is 9 and estimate Y when X is 10.

X	5	7	8	9	6
Y	2	3	6	5	4

                      5

OR

    (c) What is Regression ? What are the methods of Regression Analysis ?   5

Bachelor of Computer Application (B.C.A.) Semester—I (C.B.S.) Examination

STATISTICAL METHODS

Paper—III

Time : Three Hours] [Maximum Marks : 50

Note :— (1) **All** questions are compulsory and carry equal marks.

(2) Assume suitable data wherever necessary.

(3) Draw neat and labelled diagrams wherever necessary.

EITHER

1. (a) Explain various types of classifications. 5

(b) What is secondary data ? How does it differ from primary data ? 5

OR

(c) Define Statistics and discuss the cause of distrust of Statistics. 5

(d) Explain the different methods of collecting primary data. 5

EITHER

2. (a) Explain Histogram. Draw a histogram for the data given below :

Marks	0–4	4–8	8–12	12–16	16–20
No. of students	4	6	10	8	4

5

(b) What are the different measures of central tendency ? Explain. 5

OR

(c) The average salary of male employees in a firm was Rs. 5,200 and that of females was Rs. 4,200. The mean salary of all the employees was Rs. 5,000. Find the percentage of male and female employees. 5

(d) Obtain the median for the following frequency distribution :

x	1	2	3	4	5	6	7	8	9
y	8	10	11	16	20	25	15	9	6

5

EITHER

3. (a) Define the term dispersion. Explain any two measures of dispersion with their merits and demerits.

5

(b) Calculate the mean and standard deviation for the following distribution of 542 members :

Age (yrs.)	20–30	30–40	40–50	50–60	60–70	70–80	80–90
No. of Members	3	61	132	153	140	51	2

5

OR

(c) Define coefficient of skewness with suitable graphical representation. 5

(d) Define Kurtosis and explain normal curve, lepto kurtic and platy kurtic curve. 5

EITHER

4. (a) What are the assumptions for Karl Pearson's correlation coefficient ? Explain. 5

(b) Following table shows in inches (in) the respective heights X and Y of a sample of 12 fathers and their oldest sons :

Height X of father	65	63	67	64	68	62	70	66	68	67	69	71
Height Y of son	68	66	68	65	69	66	68	65	71	67	68	70

Construct a Scatter diagram. 5

OR

(c) Explain any two properties of Regression coefficient. 5

(d) Obtain the equations of two lines of regression for the following data. Also obtain the estimate of X for Y = 70 :

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

5

5. Attempt **all** :

(a) Give the importance and scope of statistics. 2½

(b) Find the arithmetic mean of the following frequency distribution :

x	1	2	3	4	5	6	7
f	5	9	12	17	14	10	6

2½

(c) Explain the following terms :

(i) Quartile deviation

(ii) Mean deviation. 2½

(d) Find the most likely price in Mumbai corresponding to the price of Rs. 70 at Kolkata from the following :

	Kolkata	Mumbai
Average price	65	67
Standard deviation	2.5	3.5

The correlation coefficient between the prices of commodities in the two cities is 0.8. 2½

Bachelor of Computer Application (B.C.A.) Semester—I   Examination
STATISTICAL METHODS
Paper—III

Time : Three Hours]   [Maximum Marks : 50

Note :— (1) **ALL** questions are compulsory and carry equal marks.

(2) Assume appropriate data wherever necessary.

EITHER

1. (a) Give definition of statistics and its importance.   5

   (b) What are the types of data ? Give the sources of secondary data.   5

   OR

   (c) Write a note on frequency distribution and digraph.   5

   (d) What are data representation techniques ?   5

   EITHER

2. (a) Find the geometric mean of the following data :

X	1	2	3	4	5	6	7	8	9	10
F	2	3	4	1	1	2	2	3	4	1

   5

   (b) Define formula for mean, mode and median. Discuss the relationship among them.   5

   OR

   (c) Find the mode of the following data :

X	0—4	5—9	10—14	15—19	20—24
F	6	12	7	5	0

   5

   (d) Find the harmonic mean of the following data :

X	20—29	30—39	40—49	50—59	60—69
Y	3	5	20	10	5

   5

   EITHER

3. (a) Define the term dispersion, range, variance and quartile deviation.   5

   (b) Define skewness. Find coefficients of skewness over 1, 2, 5, 9, 15, 22, 30, 40, 55, 70.

   5

   OR

   (c) Calculate the standard deviation of the following series :

   X — 40, 44, 54, 60, 62, 64, 70, 80, 90, 96.   5

   (d) Define kurtosis. Find the kurtosis of series :

   1, 2, 5, 8, 12, 17, 21, 25, 27, 28.   5

EITHER

4. (a) Calculate the correlation coefficient for the following data :

X	1	2	5	7	10	13	14	19	25
Y	4	9	10	13	16	17	20	25	27

5

   (b) Find the line of best fit for the following data :

X	1	2	3	4	5
Y	1	2	1.3	3.75	2.25

5

   OR

   (c) A computer while calculating correlation coefficient between two variables X and Y from 25 pairs of observations obtained the following results :

   $n = 25$, $\Sigma x = 125$, $\Sigma x^2 = 650$, $\Sigma y = 100$, $\Sigma y^2 = 460$, $\Sigma xy = 508$.

   It was discovered later at the time of checking that he had copied down pairs of :

X	Y
6	14
8	6

   while the correct values were :

X	Y
8	12
6	8

   Obtain the correct value of correlation coefficients.   5

   (d) Explain line of regression with example.   5

5. Attempt **ALL** :

   (a) Differentiate between primary and secondary data.   2½

   (b) Write the formula for median over the group data.   2½

   (c) What is variance ?   2½

   (d) What is significance of correlation ?   2½

Bachelor of Computer Application (B.C.A.) Semester–I Examination
STATISTICAL METHODS
Paper–III

Time : Three Hours] [Maximum Marks : 50

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Assume suitable data wherever necessary.

(3) Draw neat and labelled diagram wherever necessary.

EITHER

1. (a) Define statistics and discuss the cause distrust of statistics. 5

   (b) What is lottery method of sampling ? Explain its merits and demerits. 5

   OR

   (c) What are the different classification of statistical data ? 5

   (d) What is secondary data ? How it differs from primary data ? 5

EITHER

2. (a) Derive the median formula for continuous frequency distribution. 5

   (b) Explain Histogram. Draw a Histogram for the data given below :

Marks	:	0–10	10–20	20–30	30–40	40–50
No. of students	:	12	8	14	10	6

   5

   OR

   (c) Write formulae for Harmonic Mean and Geometric mean for discrete data. Also explain the merits of both. 5

   (d) Fine the mode for the following frequency distribution :

Size (x)	:	1	2	3	4	5	6	7	8	9	10	11	12
Frequency (f)	:	3	8	15	23	35	40	32	28	20	45	14	6

   5

EITHER

3. (a) Define the term Dispersion. Explain any two measures of dispersion with their merits and demerits. 5

   (b) Calculate quartile deviation for the following data :

Marks	:	0–10	10–20	20–30	30–40	40–50	50–60	60–70
No. of students	:	6	5	8	15	7	6	3

   5

OR

(c) Define the following terms :

    (i)   Skewness

    (ii)   Kurtosis.   5

(d) Calculate mean deviation and standard deviation for the following distribution of 542 members :

Age (in years)	Number of members
20–30	3
30–40	61
40–50	132
50–60	153
60–70	140
70–80	51
80–90	3

    5

EITHER

4. (a) Define regression. Explain the terms :

    (i)   Lines of regression

    (ii)   Regression curve   5

(b) Calculate the correlation coefficient for the following scores in Mathematics and Statistics :

Mathematics :	67	66	67	67	69	58	59
Statistics :	67	68	65	69	66	56	57

    5

OR

(c) What are the assumptions to be considered on which Karl Pearson's correlation coefficient is based ?   5

(d) Fit a straight line to the data given below :

x :	2	3	4	7	8	9	5	5
y :	9	6	5	10	9	11	2	3

    5

5. (a) What are limitations of statistics ? Explain.   2½

(b) What are the requisites for an ideal measure of central tendency ?   2½

(c) Define the following :

    (i)   Coefficient of dispersion

    (ii)   Coefficient of Variation   2½

(d) What is Scatter diagram ? Explain   2½