ASSIGNMENT BOOKLET

Post Graduate Diploma in Applied Statistics

(Specialisation in Industrial Statistics/ Biostatistics)

MST-002: Descriptive Statistics

(Valid from 1st January, 2026 to 31st December, 2026)

It is compulsory to submit the assignments before filling the Examination Form. Candidates should submit the latest assignment for the courses for which they filled the examination form. Only Work Books/Lab Record Books are needed to be submitted for the Lab Courses.

School of Sciences
Indira Gandhi National Open University
Maidan Garhi, New Delhi-110068

Dear Student,

Please read the information on assignments in the Programme Guide that we have sent you after your enrolment. A weightage of 30%, as you are aware, has been earmarked for continuous evaluation, **which would consist of one tutor-marked assignment** for this course. The assignment for MST-002 has been given in this booklet.

Instructions for Formatting Your Assignments

Before attempting the assignment, please read the following instructions carefully:

1) On top of the first page of your answer sheet, please write the details exactly in the following format:

ENROLLMENT NO :……

NAME :……

ADDRESS :……

……

……

PROGRAMME CODE: ……..

COURSE CODE: …….

COURSE TITLE: ……

STUDY CENTRE: ……..……. DATE: …….……...

PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION AND TO AVOID DELAY.

2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.

3) Leave 4 cm margin on the left, top and bottom of your answer sheet.

4) Your answers should be precise.

5) This assignment is to be submitted at the Study Centre.

   We strongly suggest that you should retain a copy of your answer sheets.

6) This assignment is valid up to December 31, 2026.

7) **You cannot fill the Exam Form for this course** till you have submitted this assignment. So solve it and **submit it to your Study Centre at the earliest.** If you wish to appear in the **TEE, June 2026,** you should submit your TMAs by **March 31, 2026.** Similarly, if you wish to appear in the **TEE, December 2026,** you should submit your TMAs by **September 30, 2026.**

We wish you good luck.

TUTOR MARKED ASSIGNMENT

MST-002: Descriptive Statistics

Course Code: MST-002

Assignment Code: MST-002/TMA/2026

Maximum Marks: 100

Note: All questions are compulsory. Answer in your own words.

1. State whether the following statements are true or false and also give the reason in support of your answer: **(5×2=10)**

(a) If $X_1, X_2, X_3, ..., X_n$ and $Y_1, Y_2, Y_3, ..., Y_n$ are the variate values of two variables X and Y, and their geometric means are G_1 and G_2, respectively, then geometric mean of (x_j/y_i); i = 1, 2, ... n will be (G_1/G_2).

(b) If X and Y are two independent variables and the variables U = X+ Y and V= X –Y, then the $r(U,V) = \frac{\sigma_X^2 - \sigma_Y^2}{\sigma_X^2 + \sigma_Y^2}$

(c) If each value of X is divided by 2 and of Y is multiplied by 2, then b'_{YX} will be same as b.

(d) The mean and standard deviation of a set of values are 25 and 5, respectively. If a constant value 5 is added to each value, the coefficient of variation of the new set of values is equal to 10%.

(e) If (A) = 90, (AB) = 40, N = 150 and (β) = 80 then (αβ) = 30.

2. **(a)** The numbers 3.2, 5.8, 7.9 and 4.5 have frequencies Y, (Y + 2), (Y - 3) and (Y + 6), respectively. If the arithmetic mean is 4.876, find the value of Y and write the whole series. **(6)**

(b) The following is the distribution of age (in years) of 800 workers:

Age Group	No. of Workers
20 — 25	50
25 — 30	70
30 — 35	100
35 — 40	180
40 — 45	150
45 — 50	120
50 — 55	70
55 — 60	60

Find (i) Median, (ii) Quartile Deviation, and (iii) Coefficient of Quartile Deviation.

(10)

3. **(a)** The value of Spearman's rank correlation coefficient of a set of non-repeating values was found to be 2/3. The sum of the squares of difference between the corresponding ranks was 55. Find the number of pairs. **(6)**

(b) Calculate Karl Pearson's coefficient of correlation between X and Y for the following data:

N = 12, $\sum X = 120$, $\sum Y = 130$, $\sum (X-8)^2 = 150$, $\sum (Y-10)^2 = 200$ and $\sum (X-8)(Y-10) = 50$. **(8)**

4. **(a)** The following table shows the information as:

Statistical Measures	Advertisement Expenditure (X) (Rs. Lakhs)	Sales (Y) (Rs Lakhs)
Mean	20	100
Standard Deviation	03	12

r(X, Y) = 0.8. Then find

(i) the expected advertising expenditure of the company if sale is Rs. 125 lakhs, and

(ii) the expected sales of the company if the advertising expenditure is Rs 32 lakhs.

(8)

(b) Given the following data:

$r_{12} = 0'8$, $r_{13} = 0.6$ and $r_{23} = 0.4$ then find (i) $r_{12.3}$ (ii) $r_{13.2}$ (iii) $r_{23.1}$ (iv) $R_{1.23}$ **(4)**

5. **(a)** An investigation of 23713 households was made in an urban and rural mixed locality. Of these 1618 were farmers, 2015 well to do and 770 families were having at least one graduate. Of these graduate families 335 were those of farmers and 428 were well to do; also 587 well to do families were those of farmers and out of them only 156 were having at least one graduate. Obtain all the ultimate class frequencies. **(6)**

(b) Can vaccination be regarded as a preventive measure for smallpox from the given data:

(i) Of 1482 persons in a locality exposed to smallpox, 368 in all were attacked, and

(ii) Of 1482 persons, 343 had been vaccinated and of these only 35 were attacked.

(6)

6. **(a)** In a statistical study relating to the prices (in T) of two shares, X and Y, the following two regression lines were found as 8X - 10Y + 70 = 0 and 20X - 9Y - 65 = 0. The standard deviation of X = 3, then find (i) the values of X and Y, (ii) r(X, Y), and (iii) standard deviation of Y. **(12)**

(b) Suppose X and Y are the two variables having the correlation coefficient 0.85. The following are the values they have:

X	Y
10	40
30	30
50	70
60	80

If two new variables X' and Y' are obtained by adding 50 to each value of X and 100 to each value of Y, respectively, calculate the correlation coefficient between X' and Y' using the above data. Also compare the results.

(8)

7. (a) 50% of items have characteristics A and B both, 35% have A, but not B, 25% have B but not A. Show that there must be some misprints in this report.

(6)

(b) In the given data, two frequencies are missing and its mean is found to be 1.46.

No. of Accidents (x)	**Frequencies (f)**
0	46
1	?
2	?
3	25
4	10
5	5
Total	200

Find the missing frequencies. **(10)**