

**2025/FYUG/ODD/SEM/
STAIDC-101T/037**

FYUG Odd Semester Exam., 2025

STATISTICS

(1st Semester)

Course No. : STAIDC-101T

(Introduction to Statistics)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

UNIT—I

1. Answer any four questions from the following : 1×4=4

- (a) What is sample?
- (b) Define ogive.
- (c) What is ordinal data?
- (d) What is secondary data?
- (e) Define qualitative data.

2.

Answer any one question from the following

(a)

Define class limit and class interval

(b)

What are the important parts of a histogram?

3.

Answer any one question from the following

(a)

Using the following data, draw a histogram :

CI :	0-10	10-20	20-30	30-40	40-50
fr :	2	5	8	10	15
CI :	50-60	60-70	70-80	80-90	90-100
fr :	17	9	7	2	1

Also obtain the frequency curve.

(ii)

What are the different types of ogive? What are the required information to draw different types of ogive? State one use of ogive.

(b)

(i) Write a note on primary data.
(ii) What are the important sources of secondary data?

UNIT-II

Answer/Fill up any four from the following :

1 × 4 = 4

(a) Define arithmetic mean.

(b) State two merits of arithmetic mean.

(c) If $\bar{x}$ be the arithmetic mean of $x_1, x_2, \dots, x_n$, then what is the arithmetic mean of $ax_1, ax_2, \dots, ax_n$?

(d) State one use of mode.

(e) Median is also known as _____ average.

5. Answer any one question from the following :

2

(a) Show that

$$\sum_{i=1}^n f_i (x_i - \bar{x}) = 0$$

(b) Write two demerits of mode.

6. Answer any one question from the following :

8

(a) (i) If $\bar{x}_i, i = 1, 2, \dots, k$ be the arithmetic mean of k series of size $n_i, i = 1, 2, \dots, k$, then prove that

$$\bar{x} = \frac{n_1 \bar{x}_1 + n_2 \bar{x}_2 + \dots + n_k \bar{x}_k}{n_1 + n_2 + \dots + n_k}$$

4

- Prove that arithmetic mean is not independent of change of origin and scale.
- (b) (i) Define median. Explain how median can be obtained graphically.
- (ii) Calculate mode from the following data :
- | | | | | | |
|------|------|-------|-------|-------|-------|
| CI : | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
| fr : | 2 | 5 | 10 | 12 | 4 |
-
- | | | |
|------|-------|-------|
| CI : | 50-60 | 60-70 |
| fr : | 2 | 1 |

UNIT—III

7. Answer/Fill up any four from the following :

- (a) Dispersion means _____.
- (b) State one demerit of range.
- (c) For mesokurtic curve, $\beta_2 =$ _____.
- (d) State the relation among mean, median and mode for a symmetric curve.
- (e) The moment about any arbitrary value is called _____.

8. Answer any one question from the following : 2

(a) Define quartile deviation. State one merit and one demerit of quartile deviation.

(b) Define coefficients of variation. State one use of coefficient of variation.

9. Answer any one question from the following : 8

- (a) (i) Write a note on kurtosis. 4
- (ii) From the following data, find the firm which has greater variability in the individual wage : 4

	Firm A	Firm B
No. of Workers	500	600
Average Daily Wage	₹ 186	₹ 175

- (b) (i) Define standard deviation. State the merits and demerits of standard deviation. 2+2=4
- (ii) Prove that standard deviation is independent of change of origin but not of scale. 4

UNIT—IV

10. Answer/Fill up any four from the following:

- (a) Define positive and negative correlation.
- (b) What is Karl Pearson's correlation coefficient?
- (c) If X and Y are two independent random variables, then $r(X, Y) = \underline{\hspace{2cm}}$.
- (d) Regression coefficients lie between $\underline{\hspace{2cm}}$ and $\underline{\hspace{2cm}}$.
- (e) Define Spearman's rank correlation coefficient.

11. Answer any one question from the following:

- (a) Prove that correlation coefficient is the geometric mean of regression coefficients.
- (b) Write some uses of correlation coefficient.

(7)

Answer any one question from the following :

- (a) (i) Prove that correlation coefficient lies between -1 and 1 . 4

- (ii) With an example, prove that two independent random variables are uncorrelated but the converse may not be true. 4

- (b) (i) Prove that regression coefficients are independent of change of origin but not scale. 4

- (ii) For two random variables X and Y , the two lines at regression are $3x + 2y - 25 = 0$ and $6x + y - 30 = 0$. Now, identify the lines of regression at X on Y and at Y on X . Also, find the correlation coefficient between X and Y . 4

UNIT—V

13. Answer/Fill up any four from the following : $1 \times 4 = 4$

- (a) Define random experiment.
- (b) If A and B are two independent events, then $P(A|B) = \underline{\hspace{2cm}}$.
- (c) Probability lies between $\underline{\hspace{2cm}}$ and $\underline{\hspace{2cm}}$.

(Turn Over

- (d) Define exhaustive event.
- (e) What is equally likely event?

14. Answer any *one* question from the following:

- (a) Write the classical definition of probability. Write the limitations of classical definition of probability.
- (b) Prove that $P(\bar{A}) = 1 - P(A)$.

15. Answer any *one* question from the following:

- (a) (i) If A and B are two independent events, then prove that $\bar{A}$ and B are also independent.

- (ii) Two dice are thrown. Find the probability that the sum of the faces in the two dice is equal to 7.

- (b) (i) If A and B are two independent events, then find the value of $P(A \cup B)$, when $P(A) = 0.6$ and $P(B) = 0.2$.

- (ii) In a family, there are three children. Find the probability that—

There is exactly two girls;
There is at least two girls;
There is at most two girls.
