



PRACTICE SET

End Semester Examination, December 2025

Program: B.Sc. (Hons.) Agriculture

Course: – Statistical Methods

Subject code: – 13A.215

Semester – Third

Course Objective:

The course objective will be to make the students to;

CO1.To learn basic concepts of mean, median and mode and to develop understanding and familiarity with these ideas.

CO2.Learn properties of correlation and compute Karl-Pearson's coefficient of correlation.

CO3. Learn to make an inference about the population of interest on the basis of a random Sample taken from that population.

CO4. Learn a comprehensive knowledge on design and how to design a study or experiment so that the results of the experiments are free from errors or biases, and then how to draw a valid conclusion using the results so obtained

I. Multiple choice Questions

(Section A)

(i) The cumulative frequency table is useful for determining the

(A) Median

(B) Correlation

(C) Mode

(D) Mean (CO1) Understand [LOT]

(ii) The sum of the squares deviations for 10 observations taken from their mean 50 is 250. The coefficient of variation is

(A) 10%

(B) 40%

(C) 50%

(D) None of these

- (iii) Which of the following is NOT a measure of central tendency?
(A) Mean (B) Median
(C) Mode (D) Standard Deviation
(CO1) Understand [LOT]

- (iv) Which measure of dispersion is most affected by extreme values?
(A) Range (B) Interquartile Range
(C) Standard Deviation (D) Mean Deviation
(CO1) Remember [LOT]

- (v) If the variance is 25, what is the standard deviation?
(A) 5 (B) 10
(C) 125 (D) 2.5 (CO1) Understand [LOT]

- (vi) If A and B are two mutually exclusive events, then $P(A \cup B) = ?$
(A) $P(A) + P(B) - P(A \cap B)$ (B) $P(A) + P(B)$
(C) $P(A) \times P(B)$ (D) None of these
(CO1) Understand [LOT]

- (vii) A fair coin is tossed once. What is the probability of getting a head?
(A) $\frac{1}{2}$ (B) $\frac{1}{3}$
(C) $\frac{1}{4}$ (D) 1 (CO1) Remember [LOT]

(ix) A card is drawn from a standard deck of 52 cards. What is the probability of drawing a king?

- (A) $\frac{1}{13}$ (B) $\frac{1}{26}$
(C) $\frac{1}{52}$ (D) $\frac{4}{13}$ (CO1) Remember [LOT]

(x) In a binomial distribution, the sum of probabilities of all outcomes is:

- (A) 0 (B) 1
(C) ∞ (D) Depends on n (CO1) Understand [LOT]

(xi) A binomial distribution has $n = 4$ and $p = 0.5$. What is the probability of exactly 2 successes?

- (A) 0.25 (B) 0.375
(C) 0.5 (D) 0.625 (CO1) Understand [LOT]

(xii) The Poisson distribution is used to model:

- (A) Continuous data (B) Normal distribution
(C) Rare events in a fixed interval (D) Uniform distribution

(CO1) Understand [LOT]

(xiii) The value of Karl Pearson's coefficient of correlation lies between:

- a) 0 and 1 b) -1 and 1
c) $-\infty$ and $+\infty$ d) 0 and ∞ (CO2) Understand [LOT]

(xiv) If $r = 0$, it means:

- a) Perfect positive correlation b) Perfect negative correlation
c) No correlation d) None of these

(CO2) Understand [LOT]

(xv) The correlation between height and weight is usually:

- a) Positive b) Negative
c) Zero d) Undefined (CO2) Remember [LOT]

(xvi) In a perfect positive correlation, the two regression lines:

- a) Coincide b) Are parallel
c) Intersect at right angles d) None of these (CO2) Understand [LOT]

(xvii) The method of drawing a scatter diagram is useful for:

- a) Finding average b) Studying correlation
c) Measuring dispersion d) None of these (CO2) Understand [LOT]

(xviii) The test of significance is used to:

- a) Find the mean of data b) Test the validity of hypothesis
c) Calculate standard deviation d) None of these (CO3) Understand [LOT]

(xix) The null hypothesis (H_0) usually states that:

- a) There is no significant difference b) There is significant difference
c) The sample mean equals zero d) Both a and c (CO3) Understand [LOT]

(xx) The t-test is applicable when:

- a) Population standard deviation is known b) Sample size is small and σ is unknown
c) Sample size is large d) None of these (CO3) Understand [LOT]

(xxi) Chi-square test is used to test:

- a) The difference between two means
- b) The independence of attributes
- c) The equality of variances
- d) None of these (CO4) Understand [LOT]

(xxii) The purpose of one-way ANOVA is to test:

- a) Difference between two means
- b) Difference among more than two means
- c) Relationship between two variables
- d) None of these (CO4) Understand [LOT]

(xxiii) In one-way ANOVA, the test statistic used is:

- a) t-test
 - b) z-test
 - c) F-test
 - d) Chi-square test
- (CO4) Remember [LOT]

(xxiv) The assumption of one-way ANOVA includes:

- a) Normality
- b) Independence
- c) Equal variance
- d) All of the above (CO4) Understand [LOT]

(xxv) In Simple Random Sampling:

- a) Each unit has equal chance of selection
- b) Each unit has unequal chance
- c) Only one unit is selected
- d) None of these (CO4) Understand [LOT]

(xxv) The statistic used in one-way ANOVA is distributed as:

- a) t-distribution
 - b) Chi-square distribution
 - c) F-distribution
 - d) Normal distribution
- (CO4) Remember [LOT]

Unit –I (Section –B)

Section: I (6Marks)

1. Calculate the standard deviation from the given data (CO2) Understand [LOT]
63, 67, 64, 59, 61, 67, 68, 66, 63, 61, 68, 61.
2. Define the Arithmetic and weighted arithmetic mean with example and the Empirical relation b/w Mean Median and Mode? (CO1) Understand [LOT]
3. Define the Bayes' Theorem with example. (CO1) Remember [LOT]
4. Discuss the Urn A contains 5 white and 8 red balls and an Urn B contains 7 white and 9 Red balls. One ball is drawn at random from one of the urns and is found to be white. Find the probability that it was drawn from urn A. (CO1) Understand [LOT]
5. Estimate the probability distribution of 3 success from a total of 10 independent trials where the probability of success on each trial is 0.3. (CO1) Understand [LOT]

Section: II (10 Marks)

6. Calculate mean deviation from median and its coefficient from the given data: (CO1)Apply [LOT]

| | | | | | |
|-----------|-----------|-----------|-----------|-----------|-----------|
| Size | 100 – 120 | 120 – 140 | 140 – 160 | 160 – 180 | 180 – 200 |
| Frequency | 4 | 6 | 10 | 8 | 5 |

7. From the following distribution determine the Median : - (CO1) Analyze [HOT]

| | | | | | | |
|----------------|-------|-------|--------|-------|--------|-------|
| Marks | 10-20 | 20-30 | 30- 40 | 40-50 | 50- 60 | 60-70 |
| No. of student | 7 | 20 | 35 | 55 | 28 | 20 |

8. Find the variance and standard deviation of the following frequency Distribution: -

| | | | | | | | | |
|-----------|---|---|---|----|----|----|----|----|
| Variable | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
| Frequency | 4 | 4 | 5 | 15 | 8 | 5 | 4 | 5 |

(CO1) Analyze [HOT]

9. Calculate the Quartile s of the following Distribution – (CO1) Apply [HOT]

| | | | | | | | | |
|------------------|-------|---------|---------|---------|---------|---------|---------|--------------|
| Ages (Years) | 15-20 | 20 - 25 | 25 – 30 | 30 – 35 | 35 – 40 | 40 – 45 | 45 – 50 | 50 and Above |
| No. of Employees | 13 | 29 | 46 | 60 | 112 | 94 | 45 | 21 |

10. Evaluate the Mode from the following frequency distribution (CO1) Analyze [HOT]

| | | | | | | | | |
|-----------------|----------|---------|----------|-----------|---------|---------|---------|---------|
| Output in units | 300 -309 | 310-319 | 320- 329 | 330 - 339 | 340-349 | 350-359 | 360-369 | 370-379 |
| No. of workers | 9 | 20 | 24 | 38 | 48 | 27 | 17 | 6 |

Unit-II (Section –B)

Section: I (6 Marks)

11. Define the Regression Co-efficient equation line. (CO2) Remember [LOT]

12. Describe the two regression equations of given data (CO2) Understand [LOT]

X: 1 2 3

Y: 5 4 6

13. Use formula of Spearman’s obtain Rank correlation coefficient.

In contest judges assessed he performance of eight candidates as shown below

| | | | | | | | | | | |
|-----------------------|---|---|---|---|---|---|---|---|---|---|
| Candidates | A | B | C | D | E | F | G | H | I | J |
| 1 st Judge | 5 | 3 | 2 | 1 | 3 | 4 | 7 | 8 | 6 | 9 |

| | | | | | | | | | | |
|-----------------------|---|---|---|---|---|---|---|---|---|--|
| 2 nd Judge | 4 | 2 | 1 | 3 | 5 | 8 | 6 | 8 | 7 | |
|-----------------------|---|---|---|---|---|---|---|---|---|--|

(CO2) Understand [LOT]

14. The coefficient of rank correlation b/w the marks in statistics and Mathematics obtained by a certain group of student is $\frac{2}{3}$ and the sum of the square of the difference in rank 55. Find the number of student in the group.
(CO2) Understand [LOT]

Section: II (10 Marks)

15. From the following data find the two-regression equation line (CO2)Analyze [HOT]

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| y | 2 | 4 | 7 | 6 | 5 | 6 | 5 |

16. Two managers are asked to rank a group of employees in order of potential for eventually becoming top managers. The ranking are as follows:

| Employees | A | B | C | D | E | F | G | H | I | J |
|---------------------|----|---|---|---|---|---|---|---|---|----|
| Ranking by Manager1 | 10 | 2 | 1 | 4 | 3 | 6 | 5 | 8 | 7 | 9 |
| Ranking by Manager2 | 9 | 4 | 2 | 3 | 1 | 5 | 6 | 8 | 7 | 10 |

(CO2) Analyze [HOT]

17. Ten students got the following percentage of marks in QM and statistics, calculate the rank correlation.

| | | | | | | | | | | |
|---------------------|----|----|----|----|----|----|----|----|----|----|
| Marks in Q M | 78 | 36 | 98 | 25 | 75 | 82 | 90 | 62 | 65 | 39 |
| Marks in statistics | 84 | 51 | 91 | 60 | 68 | 62 | 86 | 58 | 53 | 47 |

(CO2) Evaluate [HOT]

18. (i) The regression coefficient of y on x and x on y are 1.2 and 0.3 respectively. Find the coefficient of correlation.
(ii) If $\sigma_x = 10, \sigma_y = 12, b_{xy} = -0.8$, find the value of r .
(iii) If $\bar{x} = 6, \bar{y} = 7, b_{xy} = 0.65$ and $b_{yx} = 0.45$, then find the regression equations.

(CO2) Analyze [HOT]

UNIT-III (Section –B)

Section: I (6 Marks)

19. Define hypothesis and its types. (CO3) REMEMBER [LOT]
20. Define type I and type II error in test hypothesis. (CO3) REMEMBER [LOT]
21. Define one tailed test with example. (CO3) REMEMBER [LOT]
22. Write procedure for testing of hypothesis. (CO3) REMEMBER [LOT]

Section: II (10 Marks)

23. A lady stenographer claims that she can take dictation at the rate of 118 words per minute. Can we reject her claim on the basis of 100 trials in which she demonstrates a mean of 116 words and standard deviation of 15 words? (CO3) Apply [HOT]
24. A company manufacturing electric bulbs claims that the average life of its bulbs is 1600 hours. The average life and standard deviation of a random sample of 100 such bulbs were 1570 hours and 120 hours respectively. Should we accept the claim of the company? (CO3) Apply [HOT]
25. A sample of 900 members has mean 3.4cms and standard deviation 2.61cms. Is the sample population of mean 3.25cms? If the population is normal and its mean is unknown find the 95% and 98% confidence limits for true mean. (CO3) Apply [HOT]
26. A random samples of 10 bags of pesticide are taken whose weights are 50, 49, 52, 44, 45, 48, 46, 45, 49, and 45 (in Kg). Test whether the average packing can be taken to be 50 kg. ($t_{\alpha} = 2.78$) (CO3) Apply [HOT]

UNIT-IV (Section –B)

Section: I (6 Marks)

27. Define Completely Randomized Design (C.R.D). (CO4) REMEMBER [LOT]
28. Define Randomized Block Design (R.B.D). (CO4) REMEMBER [LOT]
- 29.. Define Latin Square Design (L.S.D). (CO4) REMEMBER [LOT]
30. Compare RBD and LSD. (CO4) REMEMBER [LOT]

Section: II (15 Marks)

31. Three samples of five, five, and six motors car tyres are drawn respectively from three brands A, B, and C manufactured by three machines. Find only correction factor. (CO4) Apply [HOT]

| | | | | | | |
|---|----|----|----|----|----|----|
| A | 45 | 42 | 43 | 44 | 42 | - |
| B | 41 | 40 | 42 | 43 | 40 | - |
| C | 44 | 42 | 38 | 43 | 39 | 40 |

32. A population consists of six numbers 4, 8, 12, 16, 20, 24. Consider all samples of size two which can be drawn without replacement from this population, find

(i) Population mean (ii) population standard deviation (iii) mean of sampling distribution of means (iv) standard deviation of the sampling distribution of means. (CO4) Apply. [HOT]

33. The following data give the yield on 12 plots of land in three samples, each of 4 plots, under three varieties of fertilizers A, B, and C. (CO4) Apply [HOT]

| | | |
|----|----|----|
| A | B | C |
| 25 | 20 | 24 |
| 22 | 17 | 26 |
| 24 | 16 | 30 |

Is there any significant difference in the average yield of land under the three varieties of fertilizers? [Given that F at degree of freedom (2, 9) at 5% level = 4.26]

Summary Sheet

CO Wise

| CO | Q. No. | Marks |
|----------------|-------------------------------------------------------------|------------|
| CO1 | Section- A i, ii, iii, iv, v, vi, vii, viii ix, x, xi, xii, | 7 |
| | Section – B 1,2,3,4,5,6,7,8,9, 10 | 80 |
| CO2 | Section - A xiii, xiv, xv, xvi, xvii, xviii, | 6 |
| | Section –B 11,12,13,14 ,15, 16 17, 18, | 64 |
| CO3 | Section – A xviii, xix, xx, | 03 |
| | Section - B-19,20,21,22,23,24,25,26, | 64 |
| CO4 | Section – A xxi, xxii, xxiii, xxiv, xxv | 05 |
| | Section- B 27,28,29,30,31,32,33 | 54 |
| Total = | | 283 |

Unit Wise

| Unit | Q. No. | Marks |
|---------------|--------------------------------------------------------------------------------------------------|------------|
| Unit 1 | Section- A i, ii, iii, iv, v, vi, vii, viii ix, x, xi, xii, Section – B 1,2,3,4,5,6,7,8,9, 10 | 87 |
| Unit 2 | Section- A xiii, xiv, xv, xvi, xvii, Section – B 1,2,3,4,5,6,7,8,9, 10 | 69 |
| Unit 3 | Section – A xviii, xix, xx, Section - B-19,20,21,22,23,24,25,26, | 67 |
| Unit 4 | Section – A xxi, xxii, xxiii, xxiv, xxv Section- B 27,28,29,30,31,32,33 | 59 |
| Total | | 283 |

Blooms Taxonomy Level (BTL) Wise

| BTL | Q. No. | Marks |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LOT | Section – A i, ii, iii, iv, v, vi, vii, viii ix, x, xi, xii, xiii, xiv, xv, xvi, xvii, xviii, xix, xx, xviii, xix, xx Section- B 1,2,3,4,5,12,13,14,19,20,21,,22,23,24,25,26, | 123 |
| HOT | Section – B 6,7,8,9,10,15,16,17,18,23, 24,25,26,, 31,32,33, | 160 |
| Total | | 283 |

Course Outcome:

At the end of the course student will be able to

CO1 Differentiate between the mean, the median, and the mode of data; determine the value of the mean, the median, and the mode of ungrouped and grouped data; identify the relationships among the three measures of central tendency for symmetrical and skewed distributions; state the advantages and disadvantages of the three measures.

CO2 Drawing a scatter plot for a set of ordered pairs, computing and interpreting a coefficient of correlation, determining the equation of a regression line.

CO3 Formulate null and alternative hypotheses for applications involving a single population mean or proportion; correctly formulate a decision rule for testing a hypothesis.

CO4 Constructing an ANOVA table for a one – way and two ways ANOVA when there are equal sample sizes, interpreting the results from a one–way and two–way ANOVA test

Prepared by –Dr. Manoj Kumar Mandal

Disclaimer: - This is a practice set. The Question in End semester examination will differ from the practice set. This practice set is meant for practice only.