

B.Sc. FOOD SCIENCE & TECHNOLOGY
FOURTH SEMESTER
STATISTICS AND DATA ANALYSIS
BFST-405
[USE OMR SHEET FOR OBJECTIVE PART]

SET
A

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

Marks: 20

(Objective)

Choose the correct answer from the following:

1 × 20 = 20

1. The methods of data analysis in research are:
 - a. Experimental methods
 - b. Scientific methods
 - c. Statistical methods
 - d. None of the above
2. Which of the following statement is not true?
 - a. Research is based on evidence
 - b. Research is based on believes
 - c. Research is based on scientific methods
 - d. None of the above
3. Histograms can be drawn only for.....
 - a. Continuous frequency distribution
 - b. Discrete frequency distribution
 - c. Frequency distribution
 - d. None of the above
4. Which of the following pairs of measures are independent of the extreme values?
 - a. Mean and median
 - b. Median and mode
 - c. Mean and mode
 - d. None of the above
5. In a certain distribution, median = 30, mode = 28, mean = ?
 - a. 34
 - b. 13
 - c. 31
 - d. 32
6. One of the drawbacks of the measures of central tendency is that:
 - a. It cannot measure the variation of the data
 - b. It cannot measure the average value of the data
 - c. Both a and b
 - d. Neither a nor b
7. Which of the following is the best measure of dispersion?
 - a. Mean
 - b. Mean deviation
 - c. Standard deviation
 - d. None of the above
8. In a certain distribution, if CV = 20%, standard deviation = 5, what is mean?
 - a. 15
 - b. 25
 - c. 10
 - d. None of the above
9. If one of the regression coefficients is positive, the value of the correlation coefficient is:
 - a. Positive
 - b. Negative
 - c. Zero
 - d. None of the above
10. For two variables, there is/are:
 - a. One line of regression
 - b. At least one line of regression
 - c. At least two lines of regression
 - d. Two lines of regression

11. Sample characteristics are called.....
- | | |
|---------------|----------------------|
| a. Sampling | b. Parameters |
| c. Statistics | d. None of the above |
12. The corresponding statistic of the population variance is:
- | | |
|----------------------|----------------------|
| a. Sample mean | b. Sample variance |
| c. Sample proportion | d. None of the above |
13. A process of assigning treatments to various experimental units in a purely chance manner is called:
- | | |
|------------------|----------------------|
| a. Local control | b. Replication |
| c. Randomization | d. None of the above |
14. Type-I error is:
- | | |
|--|--|
| a. Not rejecting null hypothesis when it is not true | b. Not rejecting null hypothesis when it is true |
| c. Rejecting null hypothesis when it is not true | d. Rejecting null hypothesis when it is true |
15. Which of the following statements is null hypothesis?
- | | |
|---|--|
| a. True value of the parameter is greater than its hypothetical value | b. True value of the parameter is less than its hypothetical value |
| c. There is significant difference between the true and hypothetical value of the parameter | d. There is no significant difference between the true and hypothetical value of the parameter |
16. ANOVA is used:
- | | |
|---|---|
| a. To test the several population variances | b. To test the several population means |
| c. Both a and b | d. Neither a nor b |
17. ANCOVA procedure is a combination of:
- | | |
|--|--|
| a. Analysis of variance and regression analysis | b. Analysis of variance and correlation analysis |
| c. Analysis of variance and Fisher's F-statistic | d. None of the above |
18. If the correlation between two variables X and Y is ± 1 , then:
- | | |
|---|----------------------------|
| a. X and Y are uncorrelated | b. X and Y are independent |
| c. X and Y are perfectly linearly related | d. None of the above |
19. Students t-test is applied when:
- | | |
|--|--|
| a. Sample size is small and the population standard deviation is given | b. Sample size is small and the population standard deviation is not given |
| c. Sample size is large and the population standard deviation is given | d. Sample size is large and the population standard deviation is not given |
20. The test statistic..... is used in ANOVA.
- | | |
|-------------|------|
| a. Z | b. t |
| c. χ^2 | d. F |

(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. Calculate mean, median, mode and CV of the following distribution: 10
Class: 15-25 25-35 35-45 45-55 55-65 65-75
Frequency: 3 10 15 13 7 2
2. What is Research? Write the importance of data analysis in Research. 10
3. Enumerate the interpretations of the various values of the correlation coefficient. 5+5=10
Given

| | | |
|--------------------|----|---|
| | X | Y |
| Mean | 12 | 7 |
| Standard deviation | 7 | 4 |

The correlation coefficient between X and Y is 0.85
Find the regression line of Y on X. Estimate Y when X = 14.5
4. Enumerate the principles of experimental design. Distinguish between Type-I error and Type-II error. 5+5=10
5. Explain probability sampling and non-probability sampling. 5+5=10
6. The following data give the yield on 12 plots of land of three samples under the three varieties of fertilizers A, B and C. 10
A: 25, 22, 24, 21
B: 17, 16, 16, 18
C: 24, 26, 30, 28
Test at 5% level of significance whether there is any significant difference in the average yields of land under three varieties of fertilizers. [Given, the critical value of the test statistic at 5% level of significance for (2, 9) df and (9, 2) df are respectively 4.26 and 19.38]
7. Two samples of sizes 10 and 15 are drawn from two populations of unknown variances. The variances of the two samples are 100 and 144. Test at 5% level of significance, whether the two variances are equal or not. [Given, the critical value of F at 5% level of significance with (9, 14) degree of freedom is 2.59 and with (14,9) degree of freedom is 3.04] 10
8. Write short notes on null hypothesis and alternative hypothesis. Write all the steps of testing of hypothesis. 5+5=10

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