

**B.Sc. FOOD SCIENCE & TECHNOLOGY
FOURTH SEMESTER (REPEAT)
STATISTICS AND DATA ANALYSIS
BFST-405**

**SET
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

(Objective)

Time: 30 mins.

Marks: 20

Choose the correct answer from the following:

1 × 20 = 20

- Which of the following statement is not true?
 - Research is based on evidence
 - Research is based on believes
 - Research is based on scientific methods
 - None of the above
- Which of the following pairs of measures are independent of the extreme values?
 - Mean and median
 - Median and mode
 - Mean and mode
 - None of the above
- One of the drawbacks of the measures of central tendency is that:
 - It cannot measure the variation of the data
 - It cannot measure the average value of the data
 - Both a and b
 - Neither a nor b
- In a certain distribution, if $CV = 20\%$, standard deviation = 5, what is mean?
 - 15
 - 25
 - 10
 - None of the above
- For two variables, there is/are:
 - One line of regression
 - At least one line of regression
 - At least two lines of regression
 - Two lines of regression
- The corresponding statistic of the population variance is:
 - Sample mean
 - Sample variance
 - Sample proportion
 - None of the above
- Type-I error is:
 - Not rejecting null hypothesis when it is not true
 - Not rejecting null hypothesis when it is true
 - Rejecting null hypothesis when it is not true
 - Rejecting null hypothesis when it is true
- ANOVA is used:
 - To test the several population variances
 - To test the several population means
 - Both a and b
 - Neither a nor b
- If the correlation between two variables X and Y is ± 1 , then:
 - X and Y are uncorrelated
 - X and Y are independent
 - X and Y are perfectly linearly related
 - None of the above

10. The test statistic..... is used in ANOVA.
- | | |
|-------------|--------|
| a. Z | b. t |
| c. χ^2 | d. F |
11. The methods of data analysis in research are:
- | | |
|-------------------------|-----------------------|
| a. Experimental methods | b. Scientific methods |
| c. Statistical methods | d. None of the above |
12. Histograms can be drawn only for.....
- | | |
|--------------------------------------|------------------------------------|
| a. Continuous frequency distribution | b. Discrete frequency distribution |
| c. Frequency distribution | d. None of the above |
13. In a certain distribution, median = 30, mode = 28, mean =?
- | | |
|-------|-------|
| a. 34 | b. 13 |
| c. 31 | d. 32 |
14. Which of the following is the best measure of dispersion?
- | | |
|-----------------------|----------------------|
| a. Mean | b. Mean deviation |
| c. Standard deviation | d. None of the above |
15. 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 |
16. Sample characteristics are called.....
- | | |
|---------------|----------------------|
| a. Sampling | b. Parameters |
| c. Statistics | d. None of the above |
17. 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 |
18. 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 |
19. 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 |
20. 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 |

(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

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

1. Explain probability sampling and non-probability sampling. 5+5=10
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. 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
6. Write short notes on null hypothesis and alternative hypothesis. Write all the steps of testing of hypothesis. 5+5=10
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. 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]

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