

Roll No:

2023
JH Sen

B.Tech. Food Technology
Semester VII – Examination, 2023
Paper Title: Research Methodology
Paper Code: BFTC-702

Time: 3 hours

Maximum Marks: 75

- Note:** 1. All the questions of Section A are compulsory.
2. Attempt any five questions from Section B.
3. Attempt any two questions from Section C.

Section A (15x1=15)

I. Fill in the blanks with appropriate answers for the following:

1. In simple _____ sampling, each member of the sample has an equal chance of being selected.
2. Research is a systematic _____ of data to discover new facts or validate existing theories.
3. A well-defined research problem includes clear _____, basic assumptions, and limitations.
4. Kurtosis measures the _____ of a distribution.
5. Scientific methods provide a systematic approach to _____ and testing hypotheses.
6. The range is calculated by subtracting the _____ from the maximum value.
7. Co-relations measure the _____ between two variables.
8. _____, median, and mode are measures of central tendency.
9. Skewness measures the _____ of a distribution.
10. Regression analysis assesses the _____ between two or more variables.
11. DST stands for the _____.
12. The T-Test is used to compare _____ between two groups.
13. MoFPI stands for the _____.
14. The _____ of a journal reflects its influence in the academic community.
15. The process of organizing and summarizing data is called _____.

Section B (5x6=30)

II. Attempt any five questions of the following:

- a) The ages of the signers of the Declaration of Independence of the US are shown below.

41	54	47	40	39	35	50	37	49	42	70	32
44	52	39	50	40	30	34	69	39	45	33	42
44	63	60	27	42	34	50	42	52	38	36	45
35	43	48	46	31	27	55	63	46	33	60	62
35	46	45	34	53	50	50					

Construct a frequency distribution using seven classes. Include relative frequency, percentage and cumulative frequency. Construct a histogram, frequency poly-gone, and Ogive.

- b) A salesman keeps a record of the number of shops he visits each day.

<i>Shops visited</i>	0 - 9	10 - 19	20 - 29	30 - 39	40 - 49
<i>Frequency</i>	7	63	21	60	15

Estimate the mean number of shops visited. Estimate the median. What is the modal class?

- c) The weights of coffee in 70 jars are shown in the following table:

<i>Weight (in grams)</i>	<i>Frequency</i>
200 - 201	19
201 - 202	37
202 - 203	28
203 - 204	20
204 - 205	12
205 - 206	10

Determine variance and standard deviation of the above distribution.

- d) Define research ethics and explain its significance in the context of scientific research.
e) Explain the concept of a research hypothesis. Provide an example of a well-formulated hypothesis and briefly discuss its role in the research.
f) Why is it essential to establish the basic assumptions, limitations, and delimitations of a research problem?

Section C (2x15=30)

III. Attempt any two questions of the following:

- a) Describe the meaning and significance of a research design. Discuss important concepts related to research design.
b) Set up an analysis of variance table for the following per acre production data for three varieties of wheat, each grown on 4 plots and state if the variety differences are significant.

<i>Plot of land</i>	<i>Per acre production data</i>		
	<i>Variety of wheat</i>		
	A	B	C
1	6	5	5
2	7	5	4
3	3	3	3
4	8	7	4

F (Tabulated) at 5% level is 4.26.

- c) The following data represents the number of hours 12 different students watched television during the weekend and the scores of each student who took a test the following Monday. Find the equation of the regression line. Use the equation to find the expected test score for a student who watches 8 hours of TV.

Hours, x	0	1	2	3	3	5	5	5	6	7	7	10
Test score, y	86	75	72	64	85	58	66	74	48	55	65	40

BTL, CO and PO mapping of the questions:

Section A	Mapping	Section B	Mapping	Section B	Mapping
I	BTL1,2; CO2,3,4,5,6,7; PO1,2,4,5	II a)	BTL4 ;CO2 ;PO1	III a)	BTL5 ;CO6 ;PO2
		b)	BTL2 ;CO6 ;PO4	b)	BTL5 ;CO6 ;PO2
		c)	BTL2 ;CO6 ;PO2	c)	BTL4 ;CO6 ;PO4
		d)	BTL4 ;CO6 ;PO4		
		e)	BTL2 ;CO6 ;PO1		
		f)	BTL5 ;CO6 ;PO2		