

2056
M.E. (Bio-Technology) Second Semester
MEBIO-201: Research Methodology

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

1. Answer the following questions briefly:

- a) Differentiate between primary data and secondary data.
- b) Mention any four criteria of good research.
- c) Explain the meaning of Experimental and Control groups in terms of research design.
- d) The mean of four numbers is 71.5. If three of the numbers are 58, 76, and 88, what is the value of the fourth number?
- e) Differentiate between conceptual and empirical research.
- f) What is the median of the following numbers? 10, 39, 71, 42, 39, 76, 38, 25
- g) Range is defined as _____.
- h) Differentiate between independent and dependant variable.
- i) A person who goes to the respondents and collects the data through schedules is known as _____.
- j) Give one example of each: fundamental research and applied research. (10x1)

UNIT - I

2. a) Examine the merits and limitations of the questionnaire method in collecting material.
How is it different from a schedule?
- b) What is a sample? Discuss two methods of probability sampling and two methods of non-probability sampling. (2x5)
3. a) Give your understanding of a good research design. Is single research design suitable in all research studies? If not, why?
- b) Outline steps in writing a good research proposal. Briefly mention the importance of each step. (2x5)
4. a) "Empirical research in India in particular creates so many problems for the researchers".
State the problems that are usually faced by such researchers.
- b) What is research problem? Define the main issues which should receive the attention of the researcher in formulating the research problem. Give suitable examples to elucidate your points. (2x5)

P.T.O.

(2)

UNIT - II

5. a) Ram and Mohan did a study on feelings of stress and life satisfaction. Participants completed a measure on how stressed they were feeling (on a 1 to 30 scale) and a measure of how satisfied they felt with their lives (measured on a 1 to 10 scale). The table below indicates the participants' scores. Using this data, answer the following questions:

Participant #	Stress score (X)	Life Satisfaction (Y)
1	11	7
2	25	1
3	19	4
4	7	9
5	23	2
6	6	8
7	11	8
8	22	3
9	25	3
10	10	6

Draw a scatter plot of the data and find if there is any correlation between the two factors.

- b) Explain the technique and importance of oral presentation of research findings. Is only oral presentation sufficient? If not, why? (2x5)

6. A researcher hypothesizes that electrical stimulation of the lateral habenula will result in a decrease in food intake (in this case, chocolate chips) in rats. Rats undergo stereotaxic surgery and an electrode is implanted in the right lateral habenula. Following a ten day recovery period, rats (kept at 80 percent body weight) are tested for the number of chocolate chips consumed during a 10 minute period of time both with and without electrical stimulation. The testing conditions are counter balanced. Compute the appropriate t-test for the data provided below. (t table value = 2.36),

Stimulation: 12, 7, 3, 11, 8, 5, 14, 7, 9, 10,

No Stimulation: 8, 7, 4, 14, 6, 7, 12, 5, 5, 8 (10)

7. A neuropsychologist was interested in how monkeys learn to perform a task. The task was to retrieve a coconut from the opposite side of the river. 15 wild type monkeys were assigned to one of the conditions. After learning the monkeys were required to solve the problem and the time taken to solve the problem were measured. Carry out one-way ANOVA to test the hypothesis that some forms of learning are better than others. (F table = 3.43, $p < 0.05$).

Banana reward	Observing Monkey	Observing Human
1	7	15
1	15	8
7	1	13
13	8	13
13	9	6

(10)