2072
M.E. (Bio-Technology) Second Semester
MEBIO-201: Research Methodology

Time allowed: 3 Hours

Max. Marks: 50

NOTE: *Attempt* <u>*five*</u> *questions in all, including Question No. I which is compulsory and selecting two questions from each Section.*

x-x-x

1. Answer the following questions briefly: (1X10=10)

a. Differentiate between skewness and kurtosis.

b. Mention two advantages of observation method of data collection.

c. What is the difference between standard deviation and variance?

d. Calculate is the median of the following numbers: 10, 39, 71, 42, 39, 76, 38, 25

e. Calculate z score, if the mean is 10 and S.D=2 and the given data point lies at 15.

f. Differentiate between primary and secondary data.

g. Why is important to keep a control while designing an experiment?

h. The p value signifies_____.

i. Mention one advantage and one disadvantage of written report over oral presentation.

j. Differentiate between research methods and research methodology.

Section A

2.a. . "The task of defining the research problem often follows a sequential pattern". Explain   (5)

b. Are the following nominal, ordinal, interval or ratio data? Explain your answers. (i) Temperatures measured on the Kelvin scale. (ii) School academic rank. (iii) Aadhar card numbers. (iv) Number of passengers on buses from Goa to Mumbai. (v) Code numbers given to the players in cricket team.
                                                                                (5)

3a. Describe, in brief, the layout of a research report, covering all relevant points.   (5)

b. Explain the technique and importance of oral presentation of research findings. Is only oral presentation sufficient? If not, why?
                                                                                (5)

4. Differentiate between the following, use examples if necessary.   (10)

   a) Type 1 and Type II error
   b) Survey and Experiment
   c) Oral and Written presentation style
   d) Basic and applied research

P.T.O.

Section B

5 a. In the garden pea, yellow cotyledon colour is dominant to green, and inflated pod shape is dominant to the constricted form. Considering both of these traits jointly in self-fertilized dihybrids, the progeny appeared in the following numbers: 193 green, inflated 184 yellow constricted 556 yellow, inflated 61 green, constricted Do these genes assort independently (9:3:3:1)? Support your answer using Chi-square analysis. (Chi square table value=7.88)   (6)

b. Critically examine the following: (i) Interviews introduce more bias than does the use of questionnaire.   (4)

6 Find the value of the correlation coefficient from the following table and justify your answer. (10)

Subject	Age	Glucose level
1	43	99
2	21	65
3	25	79
4	42	75
5	57	87
6	59	81

7. Students were given different drug treatments before revising for their exams. Some were given a memory drug, some a placebo drug and some no treatment. The exam scores (%) are shown below for the three different groups: Carry out a one-way ANOVA by hand to test the hypothesis that the treatments will have different effects. (F table=51, p=0.05)

Memory Drug	Placebo	No Treatment
70	37	3
77	43	10
83	50	17
90	57	23
97	63	30

x-x-x   (10)