

5. a) What do you understand by linear regression? Explain the method of fitting the line $y = a + bx$ using the method of least squares. (5)
- b) A biologist assumes that there is a linear relationship between the amount of fertilizer supplied to tomato plants and the subsequent yield of tomatoes obtained. Eight tomato plants, of the same variety, were selected at random and treated, weekly, with a solution in which x grams of fertilizer was dissolved in a fixed quantity of water. The yield y kilograms, of tomatoes was recorded,
- i) Calculate the equation of the least squares regression line of y on x .
- ii) Estimate the yield of a plant treated, weekly, with 3.2 grams of fertilizer. (15)

Plants	1	2	3	4	5	6	7	8
x	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
y	3.9	4.4	5.8	6.6	7.0	7.1	7.3	7.7

6. a) What is analysis of variance? Mention its importance in biological sciences. (5)
- b) 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 to test the hypothesis that the treatments will have different effects. (15)

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

7. a) What are the basic principles of experimental design? Briefly describe its importance. (8)
- b) Discuss about the factorial design and its importance in agriculture. (12)
8. a) What is the test of significance? Write its importance. (10)
- b) What is hypothesis testing? Briefly describe the importance of statistical hypotheses. (10)