(i) Draw a scatter diagram on graph paper.

(ii) Compute the linear regession equation.

(iii) Predict the length of fish at 9th week.

$$(2 + 7+1= 10)$$

6. Write short note on any three

(i) Hypothesis testing

(ii) Confidence Intervals.

(iii) ANOVA

(iv) Applications of Biostatistics in Biological Sciences

(v) Skewness and Kurtosis $(5 \times 3 = 15)$

Your Roll No...............

Sr. No. of Question Paper : 5560   **J**

Unique Paper Code   : 2232013602

Name of the Paper   : DSC - Methods in Biostatistics

Name of the Course   : **B.Sc. (Hons.) Zoology**

Semester   : VI NEP-UGCF

Duration : 2 Hours   Maximum Marks : 60

Instructions for Candidates

1. Write your Roll. No. on the top immediately on receipt of this question paper.

2. Use of simple calculator is allowed.

3. Statistical tables should be provided.

4. Attempt **four** questions in all, including Question No.1 which is compulsory

P.T.O.

1. (a) State whether the following statement is true or
        false.   (1 x 4=4)

    (i) Increasing the sample size decreases standard
        error.

    (ii) If β_2 = 4.15, the given distribution is
         platykurtic.

    (iii) The confidence intervals at 95% significance
          level are narrower than set at 99% level.

    (iv) F distributions are unimodal and skewed to
         right.

    (b) Explain the following symbols   (1×5=5)

    (i) H_0

    (ii) σ^2

    (iii) N

    (iv) α

    (v) p

of 2 cm. Do these data provide sufficient evidence
that the population mean of college students is
168 cm. Consider the height of students normally
distributed. (Use α= 0.05).   (5)

5. (a) Define -   (2)

    (i) Correlation and

    (ii) Regression

    (b) Calculate the coefficient of correlation (r) when
        the coefficients of regression are b_{xy} = 0.3 and
        b_{yx} = 2.7   (3)

    (c) The following data show growth, i.e. increase in
        length of body of a fish (Labeo rohita) in a pond,
        as a function of time;

Time (weeks) :	1	2	3	4	5	6	7	8
Length (cm) :	5	13	16	23	28	35	40	42

(b) Immature mice were divided in two groups. One group was injected with 4IU FSH and the other group left as control. The Gonadosomatic index (GSI) was calculated in both the groups and tabulated as follows

Control	4IU
27	89
41	77
30	66
43	79
33	70

Test the hypothesis that FSH injection has significant effect on GSI of mice at 95% significance level. (7)

(c) The mean height obtained for a sample of 200 college students is 170 cm with standard deviation

(c) Write the contribution of following scientists in biostatistics (1 x 2=2)

(i) William Sealy Gosset

(ii) Siméon Poisson

(d) Distinguish between the following: (2 x 2=4)

(i) Type I and Type II errors

(ii) Point estimation and Interval Estimation.

2. (a) Calculate the mean, variance, standard deviation (S.D.) and coefficient of variance (C.V.) from following data. (8)

Class interval	Frequency
1-3	6
4-6	19
7-9	20
10-12	5

(b) Given below are mean heights and variances of male and female students in a college:

Mean height (cm): male – 170, female- 160
Variance (cm) : male - 22, female – 12

Find out whether the heights of male or female students are more variable. (3)

(c) It is known that 30 percent of lentil seeds in a container are infested with Callosobruchus maculatus, an insect pest. When 10 seeds are randomly selected from this population, what is the probability that it will contain exactly 4 insect infested seeds? (4)

3. (a) What are the properties of chi square distribution?

Explain main differences between ' χ^2 test of Goodness of Fit' and ' χ^2 test of Independence'. (4)

(b) In an experiment, a researcher classified 200 fishes according to the sex and the parasitic infection. The data was tabulated as mentioned below,

Sex	Infected	Uninfected
Males	65	45
Females	35	55

Apply appropriate statistical test to justify that parasitic infection is independent of the sex of fish (Take $\alpha = 0.05$). (7)

(c) The mean length of 9 earthworms collected from a normal population was found to be 15.8 cm with variance 10.3. Find the 95% confidence intervals of mean. (4)

4. (a) Distinguish between one sample and two sample t- tests. (3)