Bago University
Department of Zoology
First Semester Examination, March 2019

Fourth Year BSc **Zool.4104**
(Zoology Specialization) **Inferential Statistics**
Answer ALL questions **Time Allowed: (3) Hours**

I. State TRUE or FALSE to the following statements. **(10 marks)**

1. Hypothesis must explain the facts that gave rise to the need for explanation.
2. Alternative hypothesis is usually the one which one wishes to prove.
3. The significance level is the maximum value of the probability of rejecting H_0.
4. Pair t-test values obtained before treatment.
5. The standard error of the mean formula is $S/\sqrt{n}$.
6. There are exist five kinds of correlation between two variables depending on its extent and direction.
7. A perfect positive linear relationship, in which correlation between X and Y will be +1.
8. Regression equation of Y on X indicates the changes in the values of X for changes given in Y.
9. There are three methods of studying correlation between four variables.
10. In biological experiments use of correlation coefficient is very insignificant.

II. Complete the following statements with appropriate words. **(10 marks)**

1. The set of H_a to the H_0 is referred to as the ------- .
2. The ------ test is appropriate when we have $H_0 : \mu = \mu_{H0}$ and $H_0 : \mu \neq \mu_{H0}$.
3. The normal curve Z values are not valid for ------ samples is not difficult.
4. Values of "t" value are calculated just as the ------ value was calculated.
5. Karl Pearson developed a statistical test called the ------.
6. Sampling distribution is constructed based on statistic obtained from small ------.
7. Covariation between the two variables in opposite direction is ------ correlated.
8. Sometimes two variables are measured in the same ------ such as length and weight.
9. Correlation of two variables by mathematical method is obtained by correlation ------.
10. Two variables co-varying in the same direction are ------ correlated.

III. Answer ALL questions **(10 marks)**

1. Tabulate the type I and II errors.
2. Define the degrees of freedom of a distribution.
3. Find the sampling distribution of sample means with a SE n=5, $\bar{X}$=25mg%, SD= 4mg%.
4. State the formula of variance and SE of analysis of uncorrelated groups.
5. Describe the illustration of perfect positive and perfect negative correlation.

IV. Answer ALL questions **(20 marks)**

1. State the comparison of sample mean with Population mean.
2. Explain about the test for independence of attributes in chi-square test.
3. Enumerate about the assumptions and conditions for the use of X^2 test.
4. Explain about the perfect negative correlation between two variables.

P.T.O

V. Answer ANY THREE questions **(30 marks)**

1. A certain random sample of 90 men from a hill-tribal village gave mean height of 136cm with an SD of 6cm. Discuss the suggestion that the men of this tribal village do not form a part of the Dravidian race whose mean height is 130cm. (z=1.96)

2. A pharmaceutical company develops a drug, which it claims to increase haemoglobin content in aged people. The haemoglobin content (g/100ml) of 10 subjects is measured before and after administration of the drug. On the basis of the following data, determine whether the company's is valid. (t=1.833)

Subject	1	2	3	4	5	6	7	8	9	10
Before	10	9	11	12	8	7	12	18	10	9
After	12	11	13	14	9	10	12	14	11	12

3. Two horticultural plots were each divided into six equal sub-plots. Organic fertilizer is added to Plot 1 and chemical fertilizer is added to Plot 2. The yield of fruits from Plot 1and Plot 2, in kg/sub-plot, is given below. Can we say the yield due to organic fertilizer is higher than due to chemical fertilizer? (t=1.812) (S_1=0.288, S_2=0.137)

Plot 1	6.2	5.7	6.5	6.0	6.3	5. 8
Plot 2	5.6	5.9	5.6	5.7	5.8	5.7

4. Explain about the goodness of fit test and test for independence of attributes.
5. Describe the scatter diagram method of correlation with illustration.
6. The body length and head length of 7 fishes of a species *Macroghathus aculeatus* is as follows;
   Body Length (X): 13.4, 15.1, 15.3, 16.8, 17.5, 19.2 and 21.2
   Head Length (Y) 2.1, 2.3, 2.3, 2.6, 2.7, 3.0, 3.3
   Find out regression equation.

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