JARAMOGI OGIGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF HEALTH SCIENCES
BSC. EXAMINATION
END SEMESTER EXAMINATION
SBI 3415: BIOSTATISTICS 11
KISUMU

AUGUST 2013

TIME ALLOWED: 2 hours 30 minutes.

Note: Exam has two sections (A and B)

SECTION A

QUESTION 1 (COMPULSORY)

a. State three (3) requirements to determine sample size (**3 Marks**)
b. What is chi-square test (**3 Marks**)
c. Distinguish between:
   i. P-value and confidence interval (**2 Marks**)
   ii. Simple and multiple linear regression (**2 Marks**)
   iii. Null and alternative hypothesis **(2 Marks**)

d. What does the choice of test depend on (**5 Marks)**
e. Name three (3) types of discrete distributions (**3 Marks**)

SECTION B: Answer any TWO Questions
QUESTION 2

a) Differentiate between student-t test and analysis of variance **(3 marks)**

b) The mean score on knowledge of the adverse effects of a group of 81 primary health care physicians with less than 10 years experience to the diagnosis of depression was 35.94, SD = 4.60. If the mean score on knowledge of 64 primary care physicians with more than 10 years experience was 39.8, SD = 4.05.

   i. Test if the difference in knowledge of the diagnosis of depression is statistically significant. (**9 Marks**)

   ii. What interpretation can you give the observed result (**3 Marks**)

c) Briefly discuss data transformation (**5 Marks**)

QUESTION 3

a) A Chemical Pathologist obtained cholesterol levels from 200 serum cord blood samples and calculated the mean as 1.31mmoL/L with a standard deviation of 0.36mmoL/L, if we assume sample means of cholesterol levels follow a normal distribution.

   i. Calculate the standard error (**3 Marks**)

   ii. Calculate the 95% confidence interval (**5 Marks**)

b) List six (6) procedures of testing hypothesis (**6 Marks**)

c) Briefly discuss type of errors in decision making (**6 Marks**)

QUESTION 4

a. What is correlation coefficient (**3 Marks**)

b. State four (4) properties of correlation coefficients (**4 Mark**)

c. Differentiate between:

   i. correlation and regression (**3 Marks**)
   ii. Pearson's and Spearman rank correlation (**3 Marks**)

d. Assume that the sum of squares of blood pressure is 142, sum of squares of age is 140 and sum of products about the mean for blood pressure and age is 120.

   i. Calculate the Pearson's correlation coefficient (**4 Marks**)

   ii. Comment on the results obtained in b(i) above (**3 Marks**)

QUESTION 5

a. Outline the difference between sample and population in statistics giving two (2) merits and demerits of using any of them (**5 Marks**)

b. A pediatrician examines the relationship between systolic pressure and age for a group of boys aged 5 to 13 years old. The data were analyzed with the following results

Source	SS	df	MS	Number of obs = 9
Model	312.50	1	**?**	F (1, 7) =?
Residual	335.50	?	?	Prob > F = 0.025
Total	?	8		R-squared =?
				Adj R-squared = 0.408

Variable	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
Age	2.08	0.82	2.54	0.04	?
Constant	51.92	7.70	6.75	0.0003	?

   i. Describe the relationship between blood pressure and age **(1 mark)**
   ii. What is the equation that has been fitted to the data (**2 Marks**)
   iii. Is the relationship statistically significant? Justify your answer (**2 Marks**)
   iv. Complete the Analysis of Variance table (**10 Marks**)