CHUKA   **UNIVERSITY**

UNIVERSITY SUPPLEMENTARY/SPECIAL EXAMINATIONS.

EXAMINATION FOR THE AWARD OF DEGREE OF MASTER OF SCIENCE IN NURSING

NUMS 811: BIOSTATISTICS

STREAMS: MSC (NURSING)   **TIME: 3 HOURS**

DAY/DATE: WEDNESDAY 28/08/2019   **8.30 A.M - 11.30 A.M**

INSTRUCTIONS
- Answer any **THREE** questions
- Use of calculators and statistical tables is allowed.
- Do not write anything on the question paper.

QUESTION 1: (20 MARKS)
The following results are coded values of weight gain for one-year-old babies on two different diets (factor A) sampled at three locations (Factor B).

Location	Rep	Diet 1	Diet 2
Isiolo	1	6.9	6.1
	2	7.1	5.7
	3	7.3	5.6
Mandela	1	5.8	3.9
	2	6.1	5.3
	3	6.3	5.2
Garissa	1	6.2	5.3
	2	6.6	5.7
	3	6.5	5.5

(a) Write down the statistical model.   (2 marks)

(b) Carry out the analysis of variance and perform Least Significance Difference (LSD) for means of the factor B. Use $\alpha=0.05$. TSS = 11.085 and SSAB= 0.13.   (18 marks)

QUESTION 2: (20 MARKS)
(a) A group of patients treated with two types of medicine from the same hospital were weighed after treatment and their relative weights gain recorded as follows:

Z	45	52	70	32	49	85	62	88	66	46	27	79	35	42	58	63	56
Y	50	61	81	39	59	99	72	87	73	56	37	80	45	42	68		

Construct a 95% and 99% confidence interval for the difference between the two population mean. (12 marks)

(b) The following computer output show two sets of regression analysis for thedata from a clinical trial on response (Y) of a drug at different dosage (X). Interpret the two outputs. (8 marks)

Model I-Response variable (Y)
Analysis of variance

Source	df	SS	MS	F-Value
Regression	1	249798.01	249798.01	15.628
Error	145	2269682.63	15983.68	
Total	143	2519480.64		

Estimates of regression coefficients

Variable	df	Estimate	StdError	t
Intercept	1	601.934	40.118	15.004
Dosage	1	-3.401	0.860	-3.953

Model II-Response variable (Y)
Analysis of variance

Source	df	SS	MS	F-Value
Regression	2	282587.347	141293.67361	8.906
Error	141	2236893.292	15864.49143	
Total	143	2519480.639		

Estimates of regression coefficients

Variable	df	Estimate	StdError	t
Intercept	1	868.68	189.80	4.577
Dosage	1	-16.205	8.95	-1.811
Dosage*Dosage	1	0.14	0.0996	1.438

QUESTION 3: (20 MARKS)
(a) A random sample of 6 nurses and 5 medical doctors was taken and their monthly coded incomes obtained as follows:

Nurses	5000	4250	4850	5950	6600	5200
Medical doctors	6250	4600	5850	7000	6900	

Using an appropriate non-parametric method, determine if earnings for nurses and medical doctors are the same at 5% significance level. (6 marks)

(b) The following statistics pertains serum uric acid levels in Down's syndrome and normal individuals.

Measurement	Normal	Down syndrome
Sample mean	3.4	4.5
Sample size	12	12
Population variance	1.5	1

Is there a difference between the means between individuals with Down's syndrome and normal individuals at $\alpha=0.05$? (6 marks)

(c) A survey to test if local opinion influence use of family planning was carried out and following information was obtained.

Do you use family planning	Do public opinion influence use of family planning	
	Yes	No
Yes	66	41
No	28	16

Test if use of the family planning is dependent on local public opinion or notat $\alpha = 0.05$.
(8 marks)

QUESTION4 :(20 MARKS)
(a) Discuss the various types of data measurements and data organization methods. (12 marks)

(b) A clinical trial to compare the efficacy of a new and old drug was performed using 10 patients to test the efficacy of asthma medications. Each person was to take one of the two drugs. Suppose that one person`s preference is independent of the other, find the probability that at most 4 people showed better response to the new drug. (8 marks)
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