KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2009/2010

INSTITUTIONAL BASED PROGRAMME

APRIL SESSION

EXAMINATION FOR THE DEGREE OF MASTER OF EDUCATION

PSY/MED/514: DESIGN AND ANALYSIS II

DATE: FRIDAY 3RD SEPTEMBER 2010 TIME: 9.00 A.M. - 12.00 NOON

INSTRUCTIONS

Answer ALL Questions.

1. For analyzing the covariance structures or correlation matrices two analytical methods are often used:
   i Which are they? [2 marks]
   ii. Describe the methods, bringing out shortcomings of each. [10 marks]

2. A researcher used 6 predictor variables in an effort to identify persons who were at risk for coronary artery disease. He obtained an R^2 of .74 but was concerned because the sample size was only of 25 subjects.
   a) What would be the adjusted value of R^2?
   $[R^2_{Adj} = 1-(1-R^2)(\frac{n-1}{n-k-1})]$ [3 marks]
   b) Interpret R^2 and the adjusted R^2 in the context of this research. [3 marks]
   c) Is the unadjusted R^2 great enough to allow us to conclude that the population value of R does not equal to zero?
   $$F = \frac{R^2/k}{(1-R^2)/(n-k-1)}$$
   (i.e. Test $H_0 : R_{pop} = 0$. Use $\alpha = 0.05$) [3 marks]
   d) Comment about predictor variables, their regression weights, in relation to the multiple correlation, R here and in general. [4 marks]

3. (i) Discuss maximum likelihood method as a method of estimation, bringing out strengths and shortcomings of the method as compared to other methods of estimation. [3 marks]

(ii) Give **three** other method of estimation. [3 marks]

4. (i) Give **two** methods in nonparametric and their corresponding parametric tests. [4 marks]

(ii) What is the difference between the null hypotheses tested by nonparametric test and corresponding parametric test? [2 marks]

(iii) One of the arguments put forth in favour of nonparametric tests is that they are more appropriate for ordinal-scale data. Give a reason why this argument is not an adequate one. [2 marks]

5. (a) (i) Give the structural model for two-way ANOVA [2 marks]

(ii) Discuss the assumption of the model. [3 marks]

(iii) List the point estimators for 3 parameters in the model or associated with the model. [3 marks]

(b) A family counselor is interested in the effect of three different counseling techniques on improving the self-esteem of clients from middle- and upper-class households. There were n=8 observations in each cell. Complete the ANOVA using $\alpha = 0.05$, giving actual values for degrees of freedom (df.) as well.

SUMMARY ANOVA

Source	SS	df	MS	F	F_{cv}
Class		(a-1)	101.45		
Method	8.15	(b-1)			
Interaction	401.25	(a-1)(b-1)			
Error (Within)	901.43	ab(n-1)			
Total		abn-1			

[5 marks]

(c) Interpret the results. [2 marks]

(d) Compute at least one ω^2. [2 marks]

(e) When are multiple comparisons of means done? [2 marks]

(f) Discuss **two** procedures for making comparisons among means bringing out their strengths and weaknesses [2 marks]