



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2010/2011

INSTITUTIONAL BASED PROGRAMME (IBP) AUGUST 2010 SESSION

EXAMINATION FOR THE DEGREE OF MASTER OF EDUCATION

PSY/MED/505: DESIGN AND ANALYSIS I

DATE: THURSDAY, 30TH DECEMBER 2010 **TIME:** 2.00 P.M – 5.00 P.M

INSTRUCTIONS:

Answer **question one** plus **any other two** questions.

Scientific calculators are allowed for use in the examination.

Relevant tables and formulae are availed at the back of the question paper.

QUESTION ONE (30 MARKS)

Q1a. Differentiate between the following using appropriate illustrations:

- (i) Parametric and non parametric statistics
- (ii) One tailed and two tailed hypotheses
- (iii) Type I and type II errors
- (iv) Level of significance, critical values and rejection region
- (v) What is the standard error of estimate and how is it related to the correlation?

(13 marks)

Q1b. Indicate whether each of the following statements represents a population, sample, statistic or parameter:

- (i) In 2005 there were 413 fatal accidents reported on the Kenyan roads.
- (ii) Studies have been conducted recently on the flight patterns of the flamingoes.
- (iii) Hary Black had 50 introductory Psychology students sign up to participate in his study.
- (iv) Hary Black found that 30% of the students who signed up for his hypnosis experiment could portray a trance like state by mere suggestion and not hypnosis.

(4 marks)

Q1c. Indicate whether the variables used in the following studies are **continuous or discrete** and **identify the scale of measurement they represent**:

- (i) The host of a large dinner party had predetermined the sitting arrangement of her guests. .To ensure that each person knew where to sit she placed a number on each plate and then gave her guests a number that corresponds to a particular seat.
- (ii) An environmental psychologist was interested in determining which of two signs was more effective in inducing people to walk around a construction site. To make his assessment he constructed two signs, A and B, and pinned each one in front of the construction site on alternate days for six days. He then recorded the number of people who walked through the construction site each day. He found that 54 people walked through the construction site when sign A was up but only 21 people did when sign B was up.
- (iii) A social Psychologist was interested in determining if obese people would eat more pudding if it were sweetened with sugar as opposed to saccharin. To determine whether the subjects are more of the sugar-sweetened versus saccharin-sweetened pudding, he weighed the bowl containing the pudding after making it available to the subjects.
- (iv) A biofeedback researcher used temperature biofeedback to treat a client. He measured the amount of temperature change that the client could induce in his fingertips.
- (v) A researcher was interested in determining whether suggestibility affects reaction time. He first measured the amount of time it took 50 students to depress a telegraph key 100 times. Then he gave the students a glass of orange juice and told them it contained a drug (it did not) that would allow them to depress the telegraph key more rapidly. The researcher measured the difference in the amount of time required to depress the telegraph key 100 times and after the suggestion.

(5 marks)

Q1d. Given the following data:

61, 60, 50, 52, 58, 60, 51, 55, 68, 65, 62, 47, 39, 58, 42, 47, 42, 48, 48, 46, 55, 51, 58, 65, 45, 35, 43, 54, 52, 56, 46, 53, 34, 48, 50, 39, 59, 53, 52, 70.

- (i) Make a grouped frequency distribution using the class interval of 5 with 65 – 69 as the highest class. In your frequency distribution show the following columns, apparent limits (classes), actual limits, mid points (X), tallies, frequencies, less-than cumulative frequency and its percentage cumulative frequency column.

(5 marks)

- (ii) Draw a histogram for the frequency distribution made in (a). **(3 marks)**

QUESTION TWO (20 MARKS)

a. Given the following incomplete frequency distribution, complete the columns indicated:

Class	Real limits	Mid points	f	Less than cum Freq
60 - 64	_____	_____	4	_____
-----	_____	_____	6	_____
-----	_____	_____	8	_____
-----	_____	_____	10	_____
-----	_____	_____	9	_____
-----	_____	_____	7	_____
-----	_____	_____	5	_____
-----	_____	_____	3	_____

b. Use the data above to answer the following questions:

- (i) Calculate the mean (2 marks)
- (ii) Calculate the standard deviation (4 marks)
- (iii) Calculate P75 (2 marks)
- (iv) Calculate the percentile rank (Pr) for the score 61 in the distribution. (2 marks)

c. In a test administered to 400 candidates, the mean was found to be 60 and standard deviation 5. Assuming the scores were normally distributed, answer the following questions:

- (i) What proportion of the scores fall between the scores 55 and 65? (2 marks)
- (ii) What scores cut off the middle 50% of the class? (2 marks)

- (iii) 20 students on this test failed, what was the pass mark on the test? (2 marks)
- (iv) What was the score of the student at P60? (2 marks)
- (v) Calculate the percentile rank of the student with the score 50 on this test. (2 marks)
- (vi) In what stanine would a student with a score of 40 fall? (2 marks)

QUESTION THREE (20 MARKS)

a. A clinical psychologist was interested in the relationship between number of hours of daylight and depression. The following data was collected from ten female subjects:

Subject	1	2	3	4	5	6	7	8	9	10
Daylight in hours	10.1	11.3	9.8	10.5	10.9	11.8	11.1	9.4	11.6	9.6
Depression score	14	12	17	15	10	6	13	15	10	16

- (i) Compute the Pearson product moment correlation coefficient between the hours of daylight and the level of depressions. (8Marks)
 - (ii) Test whether the relationship is significant. (2 Marks)
 - (iii) Compute the coefficient of determination (r^2) and interpret what it means. (1 Mark)
- (b) The correlation coefficient between two variables X and Y is 0.60. If the standard deviation of X variable is 1.5, the standard deviation of Y variable is 2.00, Mean X = 10 and Mean Y = 20,
- (i) Find the equation **of the regression line of Y on X**. (4 Marks)
 - (ii) The standard error of estimate of regression of y on X, (S_{yx}). (2 Marks)
- (c) If the actual score of 70 has a standard error of estimate of 1.5, and we were to be 99.0% confident of the actual score and around the predicted score, what interval of values would need to be covered? (3 Marks)

QUESTION FOUR - 20 Marks

- a. The mathematics scores of 16 students from one district showed a mean of 107 with a standard deviation of 10, while the mathematics scores of 14 students from another district showed a mean of 112 with a standard deviation of 8. Was there a significant difference between the mathematics scores of the two groups at a level of significance of:
- (i) 0.01
- (ii) 0.05? **(10 Marks)**
- b. A random sample of 186 Kenyan men were asked to record their body temperatures twice a day for a full month. From their records, an average value was found for each man. The mean of these values was 82.8 with a standard deviation of 16.5. previously, this kind of research had the mean body temperature of a Kenyan man at 83.4. Is the mean temperature of this sample significantly different from the mean temperature of men in the previous study at (i) 0.01 or at (ii) 0.05. Show your working. **(10 Marks)**

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