



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2009/2010

INSTITUTE OF OPEN LEARNING EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION

EPS 402: EDUCATIONAL STATISTICS AND EVALUATION

DATE: Saturday 20th February, 2010

TIME: 11.00 a.m. – 1.00 p.m.

INSTRUCTIONS

1. This paper is divided into sections, A and B.
2. Answer ALL questions in BOTH Sections.
3. Relevant formulae may be found at the end of this question paper.
4. Calculators may be used in this examination but NOT MOBILE PHONES.

SECTION A – (40 MARKS)

1. (a) Distinguish between the following terms using illustrations where necessary.
 - (i) Variable and constant
 - (ii) Independent and dependent variables.
 - (iii) Histogram and frequency polygon.
 - (iv) Correlation and scatter diagram (or scatter plot). [4 marks]
- (b) For each of the following instances, state the level (or scale) of measurement involved.
 - (i) Numbers assigned consecutively to students as they complete and examination comprising of 100 questions.
 - (ii) The numbers on the jerseys of football players.
 - (iii) The score you obtained on a statistics test.
 - (iv) The weights of students in a Fourth year physics class at KU.

[2 marks]

2. The table below is showing scores obtained by fifty students on a Form 4 History test

Marks	4	5	6	7	8	9
No. of students	6	7	12	15	6	4

Calculate the following measures of:

- (a) Central tendency
- (i) Mode [½ mark]
 - (ii) Median [1½ marks]
 - (iii) Mean [2 marks]
- (b) Variability.
- (i) Range [½ mark]
 - (ii) Mean deviation [2 marks]
 - (iii) Variance [3 marks]
 - (iv) Standard deviation [½ mark]
- (c) Using the measures of central tendency obtained in (a) above, describe
- (i) fully the shape of the distribution of scores and
 - (ii) the performance of the students on the test. [1 mark]

3. Using relevant examples, differentiate between the following terms:

- (a) Test and evaluation
- (b) Formative evaluation and summative evaluation.
- (c) Reliability and validity
- (d) Norm-referenced test and criterion-referenced test.
- (e) Test specifications and table of test specifications. [5 marks]

4. (a) Give and briefly explain any two measurement techniques (or methods) used for testing theoretical and practical knowledge in your school.

[3 marks]

- (b) State four factors that may affect the choice of item format (or type of test items).

[2 marks]

- (c) (i) Using suitable examples distinguish between the supply type of items and the selection type of items. [1 mark]
- (ii) Give two advantages and two disadvantages of the subjective (i.e. essay) tests as applied to school subjects. [2 marks]
- (d) Briefly explain the following terms illustrating their importance in testing.
- (i) Content validity
- (ii) Test-retest method of estimating reliability. [4 marks]

SECTION B – (30 MARKS)

5. The following scores were obtained when a group of ten Form 3 students were tested in Mathematics and Physics.

Students	A	B	C	D	E	F	G	H	I	J
Mathematics	5	6	6	7	7	8	8	10	11	12
Physics	4	6	7	5	8	6	7	8	10	9

- (a) (i) Calculate the Pearson product moment correlation coefficient, γ_{xy} , between mathematics and physics scores. [4 marks]
- (ii) Interpret your calculate value, γ_{xy} . [½ mark]
- (iii) State two assumptions underlying the Pearson product moment correlation coefficient, γ_{xy} . [1 mark]
- (b) (i) Compute the Spearman rank order correlation coefficient γ_{xy} between the variables, X and Y. [3 marks]
- (ii) Give two assumptions underlying the Spearman rank order correlation coefficient, γ_5 between the two variables, X and Y. [1 mark]
6. (a) (i) What is item analysis? [½ mark]
- (ii) What function does item analysis serve for the item constructor? [1 mark]
- (iii) Differentiate between item difficulty index and item discrimination index, using relevant examples. [2 marks]
- (b) The table below gives a summary of students' responses on two multiple-choice items (or questions).

Item No.	Group	Options				Omits	Total
		A	B	C*	D		
1.	Upper group	5	0	49	6	0	60
	Lower group	24	0	28	5	5	60
			A*	B	C	D	Omits
2.	Upper group	38	5	12	5	0	60
	Lower group	25	0	35	0	0	60

For item 1, C* is the key

For item 2, A* is the key.

- (i) Calculate the item difficulty index and item discrimination index for each item. [6 marks]
- (c) Comment on the quality of each item in the light of the item analysis data presented in b (i) above. [2 marks]
- (d) Evaluate the effectiveness of all the distractors for each of the two items. [2 marks]

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