



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2010/2011
OPEN, DISTANCE AND E-LEARNING EXAMINATION FOR THE DEGREE
OF BACHELOR OF SCIENCE

SMA 160: PROBABILITY AND STATISTICS I

DATE: Thursday 7th July 2011

TIME: 11.00a.m – 1.00p.m

INSTRUCTIONS: Answer Question ONE and any other TWO questions

QUESTION ONE (30MARKS)

- a) Given the scores 14, 20, 14, 15, 19, 18, 16.
Find the
- | | |
|------------------------|----------|
| i) Range | [2marks] |
| ii) Quartile deviation | [3marks] |
| iii) Mean deviation | [4marks] |
| iv) Standard deviation | [3marks] |
- b) The coefficient of variation and mean of a set of observations are 48% and 25 respectively. What is the variance? [3marks]
- c) Seven students sit in a row of seats. In how many ways can these students be arranged in 7 seats. [3marks]
- d) Calculate the mean deviation about the median of the following scores 20, 15, 19, 17, 14, 18, 16, [7marks]
- e) Suppose a family has 3 children. Assuming that the chance of a boy and a girl being born are equally likely. Events A and B are defined as
- A: First two children born are boys

B: Last two children born are girls

Obtain

- i) $P(A)$ [2marks]
- ii) $P(B)$ [2marks]
- iii) $P(A \cup B)$ [2marks]
- iv) $P(A \cap B)$ [2marks]

QUESTION TWO

(20 MARKS)

- a) Define skewness as used in statistics. [1mark]
- b) The table shows marks of two groups of students.

Marks	55-58	58-61	61-64	64-67	67-70
GROUP Y	12	17	25	18	11
GROUP Z	20	22	23	13	7

- i) Calculate the coefficient of skewness of two distributions. [12marks]
- ii) Comment on the skewness of the distributions. [2marks]
- iii) On the same axes, draw a histogram to represent the information for the two groups. [5marks]

QUESTION THREE

(20 MARKS)

The scores of two golfers for 24 rounds were as follows

Golfer X:	77	74	75	78	78	72	81	79	78	76	72	77
	72	74	70	78	79	80	81	74	80	73	75	71
Golfer Y:	86	84	80	88	89	85	86	82	82	79	86	80
	82	76	86	89	87	83	80	88	86	81	84	87

For each player, calculate

- a) Mean [4marks]
- b) Median [2marks]
- c) Mode [2marks]
- d) Standard deviation [6marks]
- e) Coefficient of variation [4marks]

- f) Find which golfer may be considered a more consistent player (less variable)
[3marks]

QUESTION FOUR

(20 MARKS)

- a) Learning, earning and parenting (LEAP) program is designed to encourage school attendance among pregnant and parenting teens on welfare. Eligible teens who provide evidence of school enrolment receive a bonus payment while those who do not attend school have money deducted from their grant.(i.e. the teens are “sanctioned”) The survey results of LEAP results is shown below.

Request	Percentage of teens
No. of bonuses or sanctions N	7
Only bonuses OB	37
Both, but more bonuses than sanctions (BB)	18
Both, but more sanctions than bonuses (SS)	14
Both, equal number of bonuses and sanctions (BS)	6
Only sanctions OS	18

- i) Assign probabilities to the sample points. [6marks]
- ii) What is the probability that both bonuses and sanctions are requested for a LEAP teen? [3marks]
- iii) What is the probability that only one type of request (either a bonus or a sanction but not both) is made? [3marks]
- b) In form III of Precious Saints Academy, 55% of the students are boys. Of the boys 80% come from Bungoma County but only 35% of the girls come from this County. The area Member of Parliament wishes to meet 4 students representatives from the school. The principle decides to select one of the representatives from form III.
- Find the probability that
- (i) A randomly chosen student does not come from Bungoma County. [3marks]
- (ii) Randomly chosen student comes from Bungoma County. [3marks]

- iii) One of the randomly chosen student comes from Bungoma County and is a girl. [3marks]

QUESTION FIVE

(20 MARKS)

- a) Ten pupils obtained the following scores in Mathematics and English.

Students	A	B	C	D	E	F	G	H	I	J
Maths score	30	16	18	32	20	28	16	8	19	16
English score	28	14	16	27	22	16	18	10	20	12

- i) Calculate the Spearman's Rank Order correlation coefficient. [8marks]
 ii) Comment on the value of coefficients. [2marks]

- b) An experiment to discover the relationship between the percentages of a certain drug in the blood stream and the length of time it takes to react to stimulus gave the following results.

Subject	Amount of drugs (%) x	Reaction time y (seconds)
A	1	1
B	2	1
C	3	2
D	4	2
E	5	4

The regression line of y on x can be expressed in the form $y = a + b x$. Estimate

- i) The regression line relating x and y. [8marks]
 ii) When the percentage of drug x is 2 what will be the reaction time in seconds. [2marks]