



# MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS  
2018/2019 ACADEMIC YEAR  
FIRST YEAR SECOND SEMESTER**

**BACHELOR OF ARTS IN ECONOMICS  
SECOND YEAR SECOND SEMESTER**

**SCHOOL OF BUSINESS AND ECONOMICS  
BACHELOR OF SCIENCE IN (ECONOMICS, FINANCIAL  
ECONOMICS, ECONOMICS AND STATISTICS AND  
AGRICULTURAL ECONOMICS AND RESOURCE  
MANAGEMENT)**

**COURSE CODE: ECO 1205  
COURSE TITLE: ECONOMICS STATISTICS II**

**DATE: 26<sup>TH</sup> APRIL 2019      TIME: 1100 - 1300 HRS**

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**INSTRUCTIONS TO CANDIDATES**

Answer Question **ONE** and any other **THREE** questions

**QUESTION ONE**

**(25 marks)**

a) In a given country Y, a growing number of persons pursuing a teaching credential are choosing paid internships over traditional student teaching programmes. A group of eight candidates for three local teaching positions consisted of five candidates who had enrolled in paid internships and three candidates who had enrolled in traditional student teaching programs. Let us assume that all eight candidates are equally qualified for the positions, Let x represent the number of internship-trained candidates who are hired for these positions,

Find:

- i. The probability that three internship-trained candidates are hired for these positions **(3 Marks)**
- ii. None of the three hired was internship trained **(3 Marks)**
- iii.  $P(x \leq 1)$  **(3 Marks)**

b) Over a long period of time it has been observed that a given marksman can hit a target on a single trial with probability equal to 0.8. Suppose he fires four shots at the target

- i. What is the probability that he will hit the target exactly two times? **(3marks)**
- ii. What is the probability that he will hit the target at least once? **(3marks)**
- iii. Determine  $\text{Var}(X)$  **(2marks)**
- iv. Determine  $E(X)$  **(2 Marks)**

c). A mail order merchandiser of clothing sells two product lines, one relatively expensive, the other inexpensive. A survey of orders produced the relative frequencies of orders by product line and the sex of the customer. In the table below, A is the event that the customer is female and E is the event that the order is from product line 1. Suppose that a customer who has an order is selected at random.

<b>Product Line</b>			
<b>Sex</b>	<b>1 (E)</b>	<b>2 (<math>\bar{E}</math>)</b>	<b>Totals</b>
Female (A)	0.516	0.205	0.721
Male ( $\bar{A}$ )	0.132	0.147	0.279
<b>Totals</b>	<b>0.648</b>	<b>0.352</b>	<b>1.000</b>

- i. Find the probability that the customer is female or the order is from product line 1, or both **(3 Marks)**

ii. Find  $P(E/A)$

**(3 Marks)**

## QUESTION TWO (15 MARKS)

Tool workers are subject to work related injuries. One disorder, caused by strains to the hands and wrists is called carpal tunnel syndrome. It strikes as many as 23,000 workers per year. The country's labour department estimates that the average cost of this disorder to employers and insurers is approximately Ksh. 30,000 per injured worker. These costs are said to be normally distributed with a standard deviation of Ksh. 9,000.

a) Determine the proportion of the costs lying between Ksh. 15,000 and Ksh. 45,000 (4 marks)

b) Find the proportion of the cost between Ksh5,000 and Ksh20,000 (3 marks)

c) Suppose, the mean value is unknown but the standard deviation is still Ksh. 9,000. How much would the average cost be if 79.95% of the cost was less than Ksh. 33,000 (4 marks)

d) Assume the standard deviation is unknown but 90.82% of the costs are more than Ksh.7000, determine the value of the standard deviation (4 Marks)

## QUESTION THREE

(15 MARKS)

Organization X has six production employees in total. The hourly earnings of each of the employees in Kenya shilling is given as per the table below:-

Employee	Hourly earnings
A	600
B	650
C	700
D	750
E	800
F	850

Required:

a) Determine the population mean earning (2 Marks)

b) Construct the sampling distribution of the mean earning for a sample of size two given the

sampling is done without replacement (5 Marks)

c) Find the mean of the sample means (3 Marks)

d) Determine the standard error (3 Marks)

e) Assuming sampling was done with Replacement, what would be the sample size. (2 marks)

## QUESTION FOUR

(15 MARKS)

a) The records of Jennic enterprises revealed that the mean life of a set of spark plugs is 22,100

kilometers. The distribution of the life of the plugs is approximately normal. A spark plug manufacturer claimed that its plugs have a mean life in excess of 22,100 kilometers. The director of Jennie enterprise purchased a large number of sets of spark plugs. A sample of 18 sets revealed that the sample mean life was 23,400 kilometers and the sample standard deviation was 1,500 kilometers.

Is there enough evidence to substantiate the manufacturer's claim at 0.05 level **(10 marks)**

**b) Using a flow chart explain when to use a Z-test and a student's t- tests (5 marks)**

**QUESTION FIVE**

**(15 MARKS)**

Erick was curious about the relationship between size of a family and the amount spent on food per week in Nakuru.

He took a sample of ten families from an estate in Nakuru town. The figures of family size and the amount spent on food per week in Kenya Shillings were as below.

<b>Family Size</b>	<b>Amount spent on food</b>
3	900
6	1040
5	1510
6	1290
6	1420
3	1110
4	740
4	910
5	1190
3	910

Taking the amount spent on food as the independent variable (Y)

- a) Compute the coefficient of correlation and interpret your answer **(3 marks)**
- b) Determine the coefficient of determination and interpret your answer **(1 marks)**
- c) Determine the regression equation y on x **(4 marks)**
- d) Determine the standard error of estimate **(2 marks)**

e) Using 0.05 significance level, can we conclude that there is a positive association between the amount spent on food and the family size **(5 Marks)**

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