



MUEO

# **MOI UNIVERSITY**

**OFFICE OF THE CHIEF ACADEMIC OFFICER**

## **UNIVERSITY EXAMINATIONS 2012/2013 ACADEMIC YEAR**

***END OF SEMESTER I EXAMINATIONS***

**FOR THE DEGREE OF  
EXECUTIVE MBA**

**EXAM CODE:- MBA 860**

**COURSE TITLE:- QUANTITATIVE METHODS OF MGT**

**DATE:- 11<sup>TH</sup> FEBRUARY, 2013 TIME:- 9.00A.M. - 12.00NOON.**

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**INSTRUCTION TO CANDIDATES**

**> SEE INSIDE.**

**THIS PAPER CONSISTS OF (3) PRINTED PAGES**

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INSTRUCTIONS: Answer ANY FOUR Questions

QUESTION ONE

(a) As head of a department of a consumer's research organisation, you have the responsibility for testing and comparing lifetimes of four brands of electric bulbs. Suppose you test the lifetime of the three electric bulbs of each of the four brands. The data is shown below, each entry representing the lifetime of an electric bulb, measured in hundreds of hours.

A	B	C	D
20	25	24	23
19	23	20	20
21	21	22	20

Can we infer that the mean lifetimes of the four brands of electric bulbs are equal? (7marks)

(b) State and explain the two assumptions of the analysis of variance. (4marks)

(c) With examples distinguish between the following paired terms:

- i. Dependent and Independent Events.
- ii. Complimentary and Equally likely Events
- iii. Correlation and Regression (9marks)

QUESTION TWO:

(a) Discuss the four components of a time series. (8marks)

(b) Given below are the figures of a production of a sugar factory:

Year:	2005	2006	2007	2008	2009	2010	2011
Production: (‘000’ tonnes)	40	45	46	42	47	49	46

- i. Fit a straight line trend by method of least Squares (5marks)
- ii. Estimate the value for 2015 (3marks)

(c) Differentiate between the null hypothesis and the alternative hypothesis (4marks)

### QUESTION THREE:

- a) State and explain the properties of a good estimator (6marks)
- b) Distinguish between Type I and Type II errors (4marks)
- c) A company make a micro-chip in batches of 6. In a sample of 100 batches the following numbers of rejects were found:

Number of rejects Found in batch	Number of batches
0	17
1	32
2	21
3	18
4	9
5	2
6	1
	<u>100</u>

Test at the 5% level to see whether the frequency of rejects in the batch conforms to a Binomial Distribution. (10marks)

### QUESTION FOUR

An investment company advertised the sale of pieces of land at different prices. The following table shows the pieces of land, their acreage and costs.

Piece of Land	(X) Acreage Hectares	(Y) Cost Ksh 000
A	2.3	230
B	1.7	150
C	4.2	450
D	3.3	310
E	5.2	550
F	6.0	590
G	7.3	740
H	8.4	850
J	5.6	530



Required;

- a) Determine the regression equations of Y on X. (10 marks)
- b) Estimate the cost of piece of land with 4.5 hectares. (5 marks)
- c) Estimate the expected average if the piece of land cost Ksh 900,000. (5 Marks)

### QUESTION FIVE

- a) The past records of Eldo industries indicate that about 4 out of 10 of the company's orders are for export. Further their records indicate that 48 % of all orders are for export in one particular financial quarter. The expected to satisfy about 80 orders in the next financial quarter.

Required:

- i. Determine the probability that they will break their previous export record. (7marks)
  - ii. Explain why you have used the approach you have chosen to solve part (i) above (2marks)
- b) Yana Tyre Company has just developed a new steel-belted radial tyre that will be sold through a national chain discount store. Because the tyre is a new product, the company's management believes that the mileage guarantee offered with the tyre will be an important factor in the consumer acceptance of the product. Before finalising the tyre mileage guarantee policy, the actual road test with the tyres shows that the mean tyre mileage is 36,500 Kilometres and the standard deviation is 5,000 Kilometres. In addition, the data collected indicated that a normal distribution is a reasonable assumption.

Required:

- i. Yana Tyre Company will distribute the tyres if 20% of the tyres manufactured can be expected to last more than 40,000 Kilometres. Should the company distribute the tyres? (4marks)
  - ii. The company will provide a discount on the new set of tyres if the mileage on the original tyres does not exceed the mileage stated on the guarantee. What should the guarantee mileage be if the company wants no more than 10% of the tyres to be eligible for the discount? (4marks)
- c) Explain briefly some of the advantages of the standard normal distribution (2marks)

## QUESTION SIX

- a) Explain the requirements of the linear programming model (6marks)
- b) A firm produces two products, X and Y with a contribution of 8 sh and 10 sh per unit respectively.

	Labour hours	Material A	Material B
X	3	4	6
Y	5	2	8
Total Available	500	350	800

Required;

- i. Formulate the LP model in a standardised manner.
- ii. Solve the model in (i) above using the graphical method. (16marks)

**END**