



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**UNIVERSITY EXAMINATION (KLC) 2014**

**3<sup>RD</sup> YEAR 1<sup>ST</sup> SEMESTER EXAMINATION FOR THE DEGREE OF THE  
BACHELORS OF BUSINESS ADMINISTRATION**

**SCHOOL OF BUSINESS AND ECONOMICS**

**COURSE CODE: ABA 315**

**COURSE TITLE: QUANTITATIVE METHODS I.**

**DATE:..... TIME :.....**

**DURATION: TWO HOURS**

**INSTRUCTIONS**

This paper contains FIVE (5) questions.

Answer question one (1) and ANY other TWO questions.

Write all the answers in the booklet provided

**Q1.**

- a) The demand of a certain product is represented by the equation,  $P = 40 + 4q - q^2$ , where  $q$  is the number of units demanded and  $P$  is the price per unit.

Required:

Establish the marginal revenue function and determine the marginal revenue if the number of units produced is 4 units. (6 marks)

- b) A manufacturing firm can sell  $x$  units of a product per week, at a price of  $P = 100 - 2x$  each. The cost of producing  $x$  units is  $C = 75x + 1000$ .

Determine the number of units the manufacturer should produce to maximize his profit.

(9 marks)

- c) Machine A, B and C produces 60%, 30% and 10% of the total production respectively. Defectives for machine A, B and C are also; 1%, 2% and 3% respectively
- i) If an item is selected at random, find the probability that the item is defective.

- ii) Using the information in (c) above and assuming that some item are found to be defective find, the probability that it was produced from machine A, B and C (10mks)
- iii) Outline Five important aspects for the use of probability in decision making (5marks)

**Q2.**

- a) Explain the meaning of forecasting and outline the FOUR questions that need to be answered before making investment decision. (7 marks)
- b) Storage sales at Kaplan supply is shown on the table 2.1

**Table 2.1**

Months	Jan	Feb	March	April	May	June	July	Aug.	Sept	Oct	Nov.	Dec.
Sales	10	12	13	16	19	23	26	30	28	18	16	14

Required:

- i) Calculate three months moving average.
  - ii) Predict for the forecast for January the following year (9 marks)
- c) i) Explain what is meant by exponential smoothening in trend analysis  
 ii) In January a car dealer predicted February demand for 170 units for Toyota Harrier car sales. Actual sales for the month was 190 units, using smoothening constant Of 0.2 , forecast for the demand for march using exponential smoothening model. (4 marks)

**Q3.**

- a) Outline the SIX basic steps adopted in decision making (6 marks)
- b) Debbie Clair is considering possibility of opening a small dress shop on JomoKenyattaavenue a few meters from the university. She has located a mall that attracts students. Her options are to open a small shop, a medium shop or no shop at all. The market for the dress shop can be good, average or bad. The probability for the three possibilities are 0.2 for good market, 0.5 for average market and 0.3 for bad market, the net loss and gain for the various market conditions are given in the table 3.1

**Table 3.1**

Alternatives	Good market	Average	Bad market
Small shop	KShs 75,000	Kshs 25,000	(Kshs 40,000)
Medium shop	Kshs 100,000	Kshs35000	(Kshs60,000)
No shop	0	0	0

Probability	0.2	0.5	0.3
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Required:

- i) Construct the decision tree for this situation.
- ii) Determine the expected monetary value (EMV) for each alternative decision.
- iii) Establish the optimal decision that can be made by Debbie Clair. (14 marks)

**Q4.**

- a. i) Define a project?
- ii) Explainsix salient characteristics of a project (8marks)
- b) The following information was given for the project

Activity	Time(Days)
1-2	2
1-3	7
2-3	4
2-4	3
3-4	2

Required:

- i) Determine ES and EF of each activity.
- ii) Sketch the network and determine the critical path.
- iii) Slack time of the project (12 marks)

**Q5.**

- a) Explain the following terms as applied to time series analysis
  - i) Trend
  - ii) Cyclical fluctuation
  - iii) Seasonal variations
  - iv) Irregular variations (8 marks)
- b) The past data regarding sales of Colgate products for the last seven years is given in table 5.1.

Year	1	2	3	4	5	6	7
Sales	18	17	15	24	20	25	30

Required:

Using the least square method determine:

- i) The equation of the straight line.
- ii) Estimates the sales for the year 1996 and 1997. (12 marks)