JARAMOGI OGINGA ONDINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

UNIVERSITY EXAMINATION 2012/2013

THIRD YEAR SECOND SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF BUSINESS ADMINISTRATION WITH IT

ABA 315: QUANTITATIVE METHODS I (JOOUST MAIN CAMPUS) DATE:

INSTRUCTIONS:

1. **This paper contains FIVE questions**
2. **Answer question ONE and ANY other two questions**
3. **Write all answers in the booklet provided**
4. **Annual planning period 300 days**

QUESTION ONE

a) Outline the SIX basic steps adopted in decision making **(6marks)**

b) A food product company is contemplating the introduction of a revolutionary new product with a new packaging to replace the existing product at same price (S_1) or a moderate change in the existing product with a new packaging at a small increase in price (S_2) or a small change in the existing product but without the word ' New' for a negligible increase in price (S_3). The three possible states of nature are: high increase in sales (N_1), no change in sales (N_2) and decrease in sales (N_3). The marketing department of the company provides the pay-off table below for combinations of states of nature and courses of action available.

Courses of action	States of nature		
	N_1	N_2	N_3
S_1	700,000	300,000	150,000
S_2	500,000	450,000	0
S_3	300,000	300,000	300,000

Which strategy should be chosen on the basis of:

i) Maximin principle (3marks)
ii) Laplace principle (3marks)
iii) Savage principle (5marks)

c) A company has annual demand for a product **Z** of 60,000 p.a. the cost per unit is Kshs. 4,500 and stockholding cost is 33%p.a of the stock value. Delivering cost per batch is Sh.320.

Required:

i) Optimal inventory quantity **(4marks)**

ii) Total inventory cost for this transaction**.** **(4marks)**

iii) Number of orders per year for this EOQ **(2marks)**

iv) Outline three benefits of inventories for a business enterprise**.(3marks)**

QUESTION TWO

The following table shows the assessed values (in thousands dollars) and the selling prices (in thousands dollars) of eight houses, constituting a random sample of all houses sold recently in a metropolitan area:

Assessed valu(x)	70.3	102	62.5	74.8	57.9	81.6	110.4	88
Selling price (y)	114.4	169.3	106.2	125	99.8	132.1	174.2	143.5

(a) Fit a least squares line that will enable us to predict the selling price of a house in that metropolitan area in terms of its assessed value. **(8marks)**

(b) The standard error of regression of selling price on the assessed value. **(10marks)**

(c) Selling price when x=78.9 or 114.2. **(2marks)**

QUESTION THREE

a) Differentiate the following terms as used in network analysis

i) Predecessor and successor activities **(2marks)**

(ii) An activity and an event **(2marks)**

(iii) A merger and a burst events **(2marks)**

b)

Activity	Preceding Activity	Duration (Weeks)
A	-	8
B	A	6
C	-	10
D	-	6
E	C	2
F	C,D	15
G	B,E,F	5
H	F	8
I	G,H,J	6
J	A	4

REQUIRED:

i. Network diagram for the project **(8marks)**
ii. Project critical path and duration **(3marks)**
iii. Free float **(3marks)**

QUESTION FOUR

A company is considering investing in an Automatic Machine for a period of two years. The machine initial cost is estimated to be $125,000 and has the following estimated possible after-tax cash inflow pattern: In year 1, there is a 40 percent chance that the after-tax cash flow will be $45,000, a 25 percent chance that it will be $65,000, and a 35 percent chance that it will be $90,000. In year 2, the after-tax cash inflow possibilities depend on the cash inflow that occurs in year 1; that is, the year 2 after-tax cash inflows are conditional probabilities. Assume that the firm's after-tax cost of capital is 12 percent. The estimated conditional after-tax cash inflows (ATCI) and probabilities are summarized as shown below:-

If $ATCI_1$ = $45,000		**If $ATCI_1$ = $65,000**		**If $ATCI_1$ = $90,000**	
$ATCI_2$ ($)	**Probability**	**$ATCI_2$ ($)**	**Probability**	**$ATCI_2$ ($)**	**Probability**
30,000	0.3	80,000	0.2	90,000	0.1
60,000	0.4	90,000	0.6	100,000	0.8
90,000	0.3	100,000	0.2	110,000	0.1

Required:

i) Advise the company on the viability of the machine using a decision tree. **(16 marks)**

ii) Outline four benefits of a JIT for inventory management. **(4marks)**

iii)

QUESTION FIVE

The Pay-off table below indicates the financial reports purchased by Managers of a mutual funds and banks on a weekly basis. Due to high cost of these reports, demand per week is limited to a maximum of 30 units. Demand has always equal production.

Pay-off matrix

	Number of reports produced per week			
	0	**10**	**20**	**30**
DEMAND				
0	0	-200	-400	-600
10	-250	300	100	-100
20	-250	50	600	400
30	-250	50	350	900

Use the pay-off matrix to compute the optimal decision using each of the criterions below:

i) Maximax **(3marks)**

ii) Hurwitz criteria (α=0.4) **(9marks)**

iii) EMV given that the respective demand levels are 0.3, 0.25 and 0.45 probabilities of occurrence. **(4marks)**

iv) List four principles that guide construction of a network diagram. **(4marks)**