

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:

- Maximin principle **(3marks)**
- Laplace principle **(3marks)**
- 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 ($\alpha=0.4$) **(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)**