# KIBABII UNIVERSITY

## SPECIAL/SUPPLEMENTARY EXAMS

## 2016/2017 ACADEMIC YEAR

## FIRST YEAR FIRST SEMESTER

## FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

**COURSE CODE: MBA 804**

**COURSE TITLE: QUANTITATIVE ANALYSIS**

**DATE: 14TH SEPTEMBER 2017 TIME: 3.00PM – 6.00PM**

---

INSTRUCTIONS TO CANDIDATES

- Answer question one and any other two
- Time Allowed Is Three Hours
- All Other Questions Attract Equal Marks (20 Marks)

## QUESTION ONE

**(a)** Explain the significance of quantitative analysis to the modern business society (5mks)

**(b)** Outline the application of correlation and regression analysis in business (5mks)

( c) The following data is a sample of the accounts received of a small merchandising firm

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 37 | 42 | 44 | 47 | 46 | 50 | 48 | 52 | 90 |
| 54 | 56 | 55 | 53 | 58 | 59 | 60 | 62 | 57 |
| 60 | 61 | 62 | 63 | 57 | 64 | 63 | 68 | 92 |
| 67 | 65 | 66 | 68 | 69 | 66 | 70 | 72 | 35 |
| 73 | 75 | 74 | 72 | 71 | 76 | 81 | 80 | 40 |
| 79 | 80 | 78 | 82 | 83 | 85 | 86 | 88 | 38 |

(i) Using class interval of 5 i.e 35-39; make a frequency distribution table(4mks)

(ii) Construct a Stem and Leaf diagram(4mks)

(iii)Calculate the mean, mode and median from the table in (a), hence comment about the symmetry(8 mks)

(iv)Find the standard deviation and coefficient of variation(4mks)

## QUESTION TWO

a) Explain the importance of set theory in business. (4 marks)

b) Your company manufacturers large scale units. It has been shown that the marginal (or variable) cost, which is the gradient of the total cost curve, is (92 – 2x) Shs. thousands, where x is the number of units of output per annum. The fixed costs are Shs. 800,000 per annum. It has also been shown that the marginal revenue which is the gradient of the total revenue is (112 – 2x) Shs. thousands.

**Required**

(i) Establish by integration the equation of the total cost curve

(ii) Establish by integration the equation of the total revenue curve

(iii)Establish the break even situation for your company

(iv)Determine the number of units of output that would

(v) Maximize the total revenue and

(vi)Maximize the total costs, together with the maximum total revenue and total costs

(16 marks)

## QUESTION THREE

Matrix N below shows the number of items of type A, B, and C in warehouses Y and W. Matrix p shows the cost in pence per day of storing (S) and maintaining (M) one item each of A, B and C

$$N = \begin{array}{c} \\ Y \\ W \end{array} \begin{array}{c} \begin{array}{ccc} A & B & C \end{array} \\ \begin{pmatrix} 10 & 12 & 50 \\ 60 & 0 & 20 \end{pmatrix} \end{array} \qquad P = \begin{array}{c} \\ A \\ B \\ C \end{array} \begin{array}{c} \begin{array}{cc} S & M \end{array} \\ \begin{pmatrix} 2 & 0.5 \\ 3 & 1.5 \\ 2 & 0.5 \end{pmatrix} \end{array}$$

a) Evaluate the matrix (N×P) and say what it represents.

b) Stock movement occurs as follows:

At the start of the day 1:

Withdrawal of 2 type B from warehouse Y, 20 of type A from warehouse W.

At the start of day 2:

Delivery of 7 type B and 10 of type C to warehouse Y and 15 of type B to warehouse W.

Evaluate the total cost of storage and maintenance for days 1 and 2.

c) Write down without evaluating a matrix expression which could be used to evaluate the storage and maintenance cost of items A, B and C for the period from day 1 to 4. Allow for the stock movements on days 1 and 2, as described in part (b). There were no stock movements on days 3 and 4.

**QUESTION FOUR**

The following represents activities of a network.

| Activity | Preceding Activity | Duration Days |
|---|---|---|
| A | - | 4 |
| B | A | 7 |
| C | A | 5 |
| D | A | 6 |
| E | B | 2 |

| | | |
|---|---|---|
| F | C | 3 |
| G | E | 5 |
| H | B,F | 11 |
| I | G,H | 7 |
| J | C | 4 |
| K | D | 3 |
| L | I,J,K | 4 |

**Required:**

Draw the network diagram and find the critical path (10mks)
Calculate the floats of the network in question (10mks)

**QUESTION FIVE**

(a) The probability transition matrix of the switching probabilities, consider that two brands G and X share the market in the ratio of 60% to 40% respectively of customers. If in every week 70% of G's customers retain the brand but 30% switch to product x where as 80% of X's customers retain brand but 20% percent switch to brand G. Analyse the exchange in share market per week. (10 mks)

(b) A marketing division toothpaste manufacturing company has worked out the following transition probability matrices concerning the behaviors of customers before and after an advertising campaign.

Transition probability matrix
(before advertising campaign)

| FROM | TO | |
|---|---|---|
| | **Our Brand (State I)** | **Another Brand (Sate II)** |
| Our brand (State I) | 0.8 | 0.2 |
| Another Brand (sate II) | 0.4 | 0.6 |

Transition probability matrix
(After advertisement)

| FROM | TO | |
|---|---|---|
| | **Our Brand (State I)** | **Another Brand (Sate II)** |
| Our brand (State I) | 0.9 | 0.1 |
| Another Brand (sate II) | 0.5 | 0.5 |

If the advertising campaign costs Shs 20,000 per year, would it be worthwhile for the company to undertake the campaign?
You may suppose there are 60,000 buyers of toothpaste in the market and for each customer average annual profit of the company is Shs 2.50 (10 mks)