INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

FACULTY OF BUSINESS MANAGEMENT

END OF SEMESTER EXAMINATIONS - APRIL 2025

PROGRAMME: MBA

YEAR/SEM: YEAR 1/SEMESTER 2

COURSE CODE: MBA 720

NAME: QUANTITATIVE METHODS

DATE: 2025-04-15

TIME: 2:00-5:00PM

INSTRUCTIONS TO CANDIDATES:

1. Read the instructions very carefully
2. The time allowed for this examination is STRICTLY three hours
3. Read each question carefully before you attempt and allocate your time equally between all the Sections
4. Write clearly and legibly. Illegible handwriting cannot be marked
5. Number the questions you have attempted
6. Use of appropriate workplace examples to illustrate your answers will earn you bonus marks
7. Any examination malpractice detected will lead to automatic disqualification.

DO NOT WRITE ANYTHING ON THE QUESTION PAPER

Section A Section A- (40 marks)

Question 1:

Question 2 (40 marks):

A small manufacturing company in Uganda produces two types of products: Chairs (Xâ?) and Tables (Xâ??). The company wants to determine the optimal number of chairs and tables to produce in order to maximize its total profit, given its limited resources. The company has the following constraints:

Wood Availability: A maximum of 120 units of wood is available, Labor Hours: A maximum of 80 labor hours is available, Profit: The profit for each chair is $30, and for each table, it is $50. The production of these products requires resources as follows:

Product	Wood Used per Unit	Labor Used per Unit	Profit per Unit ($)
Chair (Xâ?)	8	4 hrs	30
Table (Xâ??)	10	8hr	50

The objective is to determine the optimal number of chairs and tables the company should produce to maximize profit while staying within the resource constraints.

Required:

a) Formulate the Linear Programming Model: (15 marks)

b) Plot the Constraints on a Graph and Identify the Feasible Region. (15 marks)

c) Determine the Optimal Solution Using the Objective Function (10 marks)

Section B Attempt any three questions

Question 1:

Question 7 :(20 marks)

Question:

A retail company is considering opening a new branch but is unsure whether to invest in a large store, a small store, or wait for better market conditions. The company uses a decision tree to analyze possible outcomes.

(a) Explain how a decision tree can help in making this business decision. *(10 marks)*

(b) What are the advantages and disadvantages of using decision trees? *(10 marks)*

Question 2:

Question 3 :(20 marks)

Fill up the table and construct a modified histogram for this relevant information:

(20 marks)

Class Interval	freq	Class Boundaries	Size	Adjusted Frequency
11 â?? 12 13 â?? 15 16 - 20 21 - 30 31 â?? 35 36 â?? 40 41 â?? 43	4 12 25 60 25 15 6			
	147			

Question 3:

Question 4:(20 marks)

A logistics company is trying to decide whether to expand its operations to a new city. The company uses a quantitative approach by analyzing past sales data, customer demand, and cost projections.

a) Explain how a quantitative decision-making approach can help in this expansion decision. (10 marks)

b) What are the key data sources and metrics that the company should analyze to make an informed decision? (10 marks)

Question 4:

QUESTION 11

A service-based company wants to assess customer satisfaction based on survey responses. The company uses statistical inference to analyze trends and determine areas for improvement.

1)What sampling techniques can be used to ensure a representative survey? (5 marks)

Explain how measures of central tendency (mean, median, mode) can summarize customer satisfaction levels. (5 marks)

2)How can hypothesis testing help determine if there is a significant difference in satisfaction across different service locations? (5 marks)

3)Discuss how confidence intervals can provide insights into customer satisfaction trends. (3 marks)

4)Suggest two actionable recommendations based on statistical findings to enhance service quality. (2 marks)

Question 5:

Question 8 :(20 marks)

Question:

A supermarket chain uses big data analytics to manage inventory and avoid stockouts. It tracks real-time sales data and uses predictive analytics to forecast demand.

(a) How can quantitative data analysis improve inventory management? *(10 marks)*

(b) What challenges might arise in implementing data-driven decision-making in supply chains? *(10 marks)*

Question 6:

Question 1:(20 marks)

Jagwa company ltd produces two types of products: Product A and Product B. The company wants to maximize its profit given the following conditions:

Profit per unit:

- Product A = $5
- Product B = $3

Constraints (available resources):

Material constraint: Each unit of A requires 2 kg, and each unit of B requires 1 kg. The company has a total of 100 kg of material available.

Labor constraint: Each unit of A requires 3 hours, and each unit of B requires 2 hours. The company has a total of 120 hours of labor available.

Non-negativity constraint: The number of products cannot be negative

Required:

a) Apply Simplex method of linear programing and show how this company can maximize its profits? (20 marks)