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:
TIME:

INSTRUCTIONS TO CANDIDATES:

SECTION A

Section A- (40 marks)

Question 1:

Question 1 (40 marks):

Question 1:

IUEA wants to improve its service delivery by conducting a customer satisfaction survey. The research team must decide on the best data types, collection methods, and presentation techniques to analyze customer feedback.

Required:

a. a)Describe types of data with relevant examples IUEA is likely to collect in the customer satisfaction survey. (10 marks)
b. b) Clearly explain the data collection methods most suitable for this survey, and why? (8 marks)
c. d) IUEA collects both primary and secondary data. Differentiate with relevant examples between the two using from the survey. (6 marks)
d. e) What are the best ways to present the findings of the survey to management? (6 marks)
e. f) Explain the advantages and limitations with relevant examples of using online surveys for data collection in this case? (10 marks)

Question 2:

Question 2 (40 marks):

A small manufacturing company in Uganda produces two types of

products: Chairs (X_1) and Tables (X_2). 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 (X_1)	8	4 hrs	30
Table (X_2)	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)

Question 3:

QTN 12

A manufacturing company seeks to maximize its production efficiency by determining the optimal number of units for two products, Product A and Product B. Given limited raw materials, labor hours, and production capacity, the company applies linear programming to find the best production combination.

1)Identify the fundamental components of quantitative decision-making utilized in this case. *(5 marks)*

2) Explain how constraints such as resource limitations are integrated into the linear programming model. *(5 marks)*

3)What role does the objective function play in determining the best production mix? *(5 marks)*

4)Describe how sensitivity analysis can help the company make adjustments based on changes in resource availability. *(3 marks)*

5)Provide a real-world example where linear programming has been successfully used in production planning. *(2 marks)*

SECTION B

Attempt any three questions

Question 1:

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)

Question 2:

Question 2:(20 marks)

IUEA food Hub in Uganda wants to improve customer experience. The company’s management is considering launching a new menu but first needs to understand customers' preferences, price sensitivity, and overall satisfaction with current offerings.

Required:

a) What data collection methods should the company use to gather reliable and actionable insights? Justify your answer? (Explain with examples 10 marks)

b) Provide the 10 importance of linear programming and clearly elaborate the steps how it works? (10 marks)

Question 3:

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 – 12 13 – 15 16 - 20 21 - 30 31 – 35 36 – 40 41 – 43	4 12 25 60 25 15 6			
	147			

Question 4:

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 5:

Question 5:(20 marks)

A manufacturing firm wants to optimize production by deciding how many units of Product A and Product B to produce given limited resources. The company applies linear programming to determine the best production mix.

(a) What are the key aspects of quantitative decision-making used in this scenario? *(10 marks)*
(b) How does linear programming help in solving such business problems? *(10 marks)*

Question 6:

Question 6 :(20 marks)

Question:
A company relies solely on data-driven decision-making to hire employees, using algorithms to screen candidates. However, it later realizes that its hiring process is biased, missing out on highly skilled candidates who do not fit the algorithm's parameters.

(a) What are the limitations of relying purely on quantitative methods in decision-making? (10 marks)
(b) How can businesses balance quantitative and qualitative approaches in decision-making? (10 marks)

Question 7:

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 8:

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 9:

Question 9 :(20 marks)

ABC Research Ltd. is conducting a survey to understand customer satisfaction with postal services in Uganda. The company wants to ensure fair representation of customers from different regions.

a) Explain which sampling technique would be most appropriate for this study and why. (10marks)
b) Discuss two potential challenges of using this sampling technique

and how they can be mitigated. (10 marks)

Question 10:

Question 10:(20 marks)

Posta Uganda collected data on the number of parcels delivered per day in different districts over a month. The management wants a clear presentation of the data for decision-making.

a) What data presentation methods would be best suited to summarize this dataset? Explain their advantages. *(10 marks)*
b) If the management wants to compare parcel deliveries across districts, which visualization technique would be most appropriate? Justify your choice. *(10 marks)*

Question 11:

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 12:

Qtn 12:

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)