INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

FACULTY OF BUSINESS MANAGEMENT

END OF SEMESTER EXAMINATIONS - DECEMBER 2025

PROGRAMME: MBA
YEAR/SEM: YEAR 2/SEMESTER 1
COURSE CODE: MBA 842
NAME: QUANTITATIVE ANALYSIS AND TECHNIQUES

DATE:
TIME:

INSTRUCTIONS TO CANDIDATES:

SECTION A

Section A. (40 marks)

Question 1:

A)A project manager at IUEA wants to analyze past project performance to improve future planning. She collects data on project costs, completion times, and resource utilization. The company wants to determine key trends using quantitative analysis.

Required:(20 marks)

a) What is quantitative analysis, and why is it important in project planning? (3 marks)

b) How can measures of central tendency (mean, median, mode) help in analyzing project costs? (2 marks)

c) Why is the standard deviation important in assessing project completion times? (2marks)

d) What role does variance play in project cost management? (5marks)

e) How can quantitative analysis improve resource allocation in project management? (8 marks)

B) The same manager for question 1 (A), above is analyzing completion times for different construction projects and she wants to predict project duration more accurately

Required (20 marks):

a. a) What is the importance of measures of central tendency in project timeline analysis? (6 marks)

b. b) If the mean completion time is 12 months, the median is 10

months, and the mode is 8 months, what does this indicate? (7 marks)

c. c) The standard deviation of project timelines is 3 months. How can this information help in scheduling? (3 marks)

d. d) What quantitative technique can the project manager use to forecast future project completion times? (3marks)

Question 2:

A) To enhance future planning, an IUEA project manager want to examine the performance of previous projects. She gathers information on resource usage, project expenses, and completion dates. The business wishes to use quantitative analysis to identify important patterns.

Required:(20 marks)

a) Why does project planning require quantitative analysis, and what does it entail?

(5marks)

b) What role do central tendency measures play in project analysis? (5marks)

c) Why does evaluating project completion timelines include consideration of the standard deviation? (5marks)

d) How can project management resource allocation be enhanced by quantitative analysis? (5marks)

B) In order to better precisely forecast project duration, the manager mentioned in question 1 (A) above is examining completion times

for various construction projects.

Required (20 marks):

a) How significant are measurements of central tendency in the analysis of project timelines? (3marks)

b) Project timeframes have a standard deviation of three months. In what ways does this knowledge aid in scheduling? (4marks)

c) How do metrics of centrality function in project analysis? (3 marks?)

d) In project management, how can quantitative analysis enhance resource allocation, and what part does variance play in project cost management? (10 marks)

SECTION B

Section B (60 marks) : Attempt any three questions

Question 1:

In order to predict demand for the next few months, an MBA student at IUEA specializing in Project analyzed a product's monthly sales data (in dollars) during the previous year. The following sales information is given:

Month	Sales (Dollars)
January	150
February	200
March	180
April	170
May	160
June	210

Required:

a) Discuss the implications of the central tendency measures for forecasting demand (8 mark)

b) How would extreme values (outliers) in the sales data impact the measures of central tendency and the forecasting process? (8marks)

c) Suggest alternative measures or techniques that can

complement the analysis of central tendency in forecasting demand for the product (4 marks)

Question 2:

A project manager analyzed a product's monthly sales data (in dollars) during the previous year. The following sales information is given:

Month	Sales (Dollars)
January	150
February	200
March	180
April	170
May	160
June	210
July	190
August	220
September	230
October	240
November	250
December	260

Required:

a) Calculate the mean, median, and mode for the monthly sales data and Interpret the results obtained from the measures of central tendency (10 marks).

b) What effects might extreme values (outliers) have on the forecasting process and the metrics of central tendency in the sales data? (10 points)

Question 3:

A survey is being organized by a project planner to get consumer opinions regarding the launch of a new product. The manager must select a sample of clients from a large database in order to administer the survey. Customers' demographics, past purchases, and geographic areas are all included in this database.

Required:

a) Explain the significance of sampling in the context of the project manager's customer survey? (10 marks)

b) Determine and describe which sampling method would be most suitable for choosing customers for the survey with relevant example? (10 marks)

Question 4:

To get consumer input on the launch of a new product, a project planner is setting up a survey. From a large database, the manager must select a sample of clients to administer the survey. This database contains information about the geographic areas,

purchasing histories, and demographics of the customers.

Required:

a) Detail the steps the project manager should take to implement the chosen sampling method? (6 marks)

b) Discuss potential challenges or limitations associated with the chosen sampling method and how they can be addressed? (8 marks)

c) Suggest strategies for maximizing the representativeness and reliability of the survey results obtained from the selected sample? (6 marks)

Question 5:

a) What is the primary goal of quantitative analysis in business decision-making? (4 marks)

b) Explain the four types of scales of measurement with examples in quantitative analysis? (8 marks)

c) What is the coefficient of determination (R-squared) and what does it indicate? (6 marks)

Question 6:

a) What is the purpose of data visualization in quantitative analysis? (6 marks)

b) Complete a stem-and-leaf plot for the following list of grades on a recent test in MBA-project planning and interprete: 73, 42, 67, 78, 99, 84, 91, 82, 86, 94. (10 marks)

c) What are the main characteristics of a sampling distribution?

(4 marks)

Question 7:

IUEA marketing department wants to understand consumer preferences for the new fully online programs. IUEA plans to survey a sample of students to infer the preferences of the entire market. The target population is 10,000 students. The IUEA's research team decides to use a sample size of 400 Students.

Required:

a) What are the main characteristics of a sampling distribution that the research team should be aware of? (8 marks)

b) If the population standard deviation of consumer preference scores is known to be 15, calculate the standard error of the sample mean for a sample size of 400? (8 marks)

c) Explain how the Central Limit Theorem applies to the sampling distribution of consumer preferences in this case study. (4 marks)

Question 8:

a) Why is it important for any organization to use a sampling distribution when conducting their market research? (10 marks)

b) What role does variance play in project cost management? (5 marks)

c) What assumptions must be met for the confidence interval?

(5 marks)

Question 9:

a) Describe with relevant examples how can quantitative analysis improve resource allocation in project management? (10 marks)

b) As a project manager at an international level, why do you think standard deviation is essential in assessing project completion times? (10 marks)

Question 10:

Given the profits below for the last 4 months of the year at Kira Bo Enterprises:

Month	Sales (Dollars)
January	50
February	1000
March	180
April	120

Required:

a) Obtain the measures of Spread and show their impact as far Kirabo Enterprise growth is concerned? (8 marks)

b) How would extreme values (outliers) in the sales data impact the measures of central tendency and the

forecasting process? (8marks)

c) Describe with relevant examples the importance's of quantitative analysis in Business (4 marks)

Question 11:

a) A company wants to analyze the effectiveness of its new sales strategy in increasing revenue. Describe the steps you would take to conduct inferential statistics on this data. (12 marks)

b) What are the assumptions underlying the paired t-test, and how would you verify these assumptions in our case study? (8 marks

Question 12:

a) Describe the Quantitative Analysis Process as a Project manager with relevant examples? (10 marks)

b) The following table gives the cost income of 10 staff in an office. Income (in Rs): 1780, 1760, 1690, 1750, 1840, 1920, 1100, 1810, 1050, 1950. Calculate the mean deviation, range and median (10 marks)