



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF BUSINESS AND ECONOMICS

UNIVERSITY EXAMINATION FOR DEGREE FOR BACHELOR OF BUSINESS

ADMINISTRATION AND BACHELOR OF EDUCATION (ARTS) WITH IT

3RD YEAR 2ND SEMESTER 2024/2025 ACADEMIC YEAR

MAIN

COURSE CODE: BAB 1306

COURSE TITLE: QUANTITATIVE METHODS FOR BUSINESS I

EXAM VENUE: LAB 12

STREAM:

DATE: 17/04/2025

EXAM SESSION: 15.00 – 17.00 PM

TIME: 3.00 HOURS

Instructions:

- i. Answer **question ONE** and any other **TWO questions**
- ii. Candidates are advised not to write on the question paper.
- iii. Ensure you write your Name, Registration Number, Date, booklet serial number and Signature on the attendance sheet
- iv. Candidates must hand in their answer booklets to the invigilator while in the examination room.

Question One (30 MARKS)

Inventory is viewed as a necessary evil (non-earning asset) that cannot be eliminated because maintaining inventory increases carrying cost and blocks money that could have been used for alternative productive purposes. However, it is considered a necessary investment to achieve workable system of production, distribution and marketing of physical goods. Discuss the important reasons for carrying inventory (4 marks)

(a) A company made the following purchases in June 2024

Dates	Units	Prices (Kshs)
1 st	150	6
10 th	200	6
15 th	200	5
28 th	150	5

A physical count on June 30th reveals 250 units on hand. Calculate the cost of ending inventory and the cost of goods sold under FIFO. (6 marks)

(b) The linear trend of sales of a company is Kshs 650,000 in 1995 and it rises by Kshs16, 500 per year.

(i) Write down the trend equation. (4 marks)

(ii) If the company knows that its sales in 1998 will be 10% below the forecasted trend sales, find its expected sales in 1998. (6 marks)

(c) Four bad apples are mixed accidentally with 20 good apples. Obtain the probability distribution of the number of bad apples in a draw of 2 apples at random. (6 marks)

(d) Determine the following integrals

i. $\int ax^3 dx$ (2 marks)

ii. $\int 20x^5 dx$ (2 marks)

Total 30 Marks

SECTION B

Question Two

(a) Discuss the importance of quantitative methods to an organization citing relevant practical examples (4 Marks)

(b) Given revenue function $R = 12q - 2q^2$

$$C = 22 - 2q + 5q^2$$

- (i) Find the output Q that maximizes profit. (2 marks)
- (ii) The profit at that output (2 marks)
- (iii) Price at profit maximization (2 marks)

(c) The table below shows the sales of new cars by quarters during a period of three years.

Year	Quarter 1 Kshs 'Millions'	Quarter 2 Kshs 'Millions'	Quarter 3 Kshs 'Millions'	Quarter 4 Kshs 'Millions'
2001	55	76.5	61.2	77.8
2002	54.4	65.9	52.7	81.4
2003	59.3	83.2	78.5	93.0

Required:

- (i) the seasonal index for each quarter assuming an additive model. (10 marks)

Question Three

- (a) From the following series of annual data, find the trend line by the method of semi averages.

Also estimate the value for 1999.

Year:	1990	1991	1992	1993	1994	1995	1996	1997	1998
Actual Value:	170	231	261	267	278	302	299	298	340

- (b) From a bag containing 4 white and 6 red balls, three balls are drawn at random.

- (i) Find the expected number of white balls down. (6 Marks)
- (ii) If each white ball drawn carries a reward of Kshs. 4 and each red ball Kshs. 6, find the expected reward of the draw. (4 marks)

Question Four

- (a) The production department of a company requires 3,600 kg of raw material for manufacturing a particular item per year. It has been estimated that the cost of placing an order is Kshs 36 and the cost of carrying inventory is 25 per cent of the investment in the inventories. The price is Kshs 10 per kg. Help the purchase manager to determine an ordering policy for raw material. (10 marks)
- (b) An electronic firm purchases its supplies from 4 different supplier Kshs A Ltd supplies 20%, B Ltd 30% C Ltd 25% and D Ltd 25%. A Ltd tends to have the best quality. Only 3% of their supplies are defective. B Ltd supplies are 4% defective, C Ltd 7.0% and D Ltd 6.5% defective
 - (i) What is the probability of selecting a defective item? (2 marks)
 - (ii) A defective supply was discovered in two shipments. What's the probability that it came from A Ltd (2 Marks)

- (iii) What's the probability that the defective supply came from A ltd, C ltd and D ltd
(2 marks)

(c) Briefly Explain the following terms in relations to Project Management.

- (i) Task/activity (2 marks)
(ii) Project (2 marks)

Question Five

Rodgers Otieno is the project manager of Siaya Construction Company. The company is bidding on a contract to install telephone lines in a small town. It has identified the following activities along with their predecessor restrictions, expected times and worker requirements.

Activity	Predecessors	Duration Weeks	Crew Size Workers
A	-	4	4
B	-	7	2
C	A	3	2
D	A	3	4
E	B	2	6
F	B	2	3
G	D,E	2	3
H	F,G	3	4

Rodgers Otieno has agreed with the client that the project should be completed in the Shortest duration.

Required:

- (i) Draw a network for the project. (2 marks)
(ii) Determine the critical path and the shortest project duration. (16 marks)
(iii) Rodgers Otieno will assign a fixed number of workers to the project for its entire duration and so she would like to ensure that the minimum number of workers is assigned and that the project will be completed in 14 weeks.

Draw a schedule showing how the project will be completed in 14 weeks. (2 marks)

(Total 20 marks)