



TECHNICAL UNIVERSITY OF MOMBASA
Faculty of Business & Social Studies

DEPARTMENT OF BUSINESS STUDIES

DIPLOMA IN PROCUREMENT AND MATERIALS MANAGEMENT I

DIPLOMA IN BUSINESS MANAGEMENT I

BAC 2201: QUANTITATIVE TECHNIQUE

END OF SEMESTER EXAMINATIONS

SERIES: APRIL 2013

TIME: 2 HOURS

INSTRUCTIONS:

- This paper consists of **FIVE** questions.
- Answer question **ONE (Compulsory)** and any other **TWO** questions.

This paper consists of Four printed pages.

QUESTION 1 (Compulsory)

a) A community development group deposited Ksh 360,000 in a bank at a rate of interest 9% p.a for a period of 3 years. Calculate.

i) The _____ simple _____ interest
(2marks)

ii) The _____ compound _____ interest
(5marks)

iii) The difference between compound interest and simple interest
(2marks)

b) Mombasa county council has a plan to buy a water pump after 3 years which will cost them Ksh 250,000. They deposited Ksh 100 000 at the beginning of first year, and Ksh 50 000 at the beginning of second year.

Calculate the amount which they should deposit at the beginning of third year if compound interest is paid at the rate of 10% per annum to enable them to buy the machine. (6marks)

Evaluate the following;

i) Derive of $y = (x + 3)(2x^{3+} + x^2 - 3)$

ii) Given the function $y = 2x^3 - 5$

iii) $\int 20x^5 dx$

(3marks)

c) A bookshop vendor sold 5 statistics books and 6cos accounting books for sh24,400 to Tezo college

The vendor sold 7 statistics books and 9 cost accounting books for sh.35600 to Ganze colloge.

Formulate simultaneous equations to equations to represent the above problem. (1mark)

Use matrix algebra to compute the price of a statistics book and the price of a cost accounting book. (5marks)

QUESTION 2

PEVU Ltd intends to invest in either project A or project B. The intial cash outlay is two million shillings. The following are the expected cash inflows from the projects:

Year	Project A Sh	Project B Sh.
1	600000	700000
2	500000	800000
3	900000	1200000
4	400000	200000
5	500000	400000

The company's cost of capital is 10%

Advise the management on the project to select using;

- i) Net present value (10marks)
- ii) Payback period method (10marks)

QUESTION 3

a) Bahari company Ltd has analyzed its past records and derived its total cost functions as $c = 14 + 3q$ And the total revenue function as $R = 19q - 2q^2$, Where q is quantity of items produced in thousands while the values of cost, revenue and profit are in millions Determine;

- i) The total profit function. (2marks)
- ii) The quantity of production that maximizes profit and the corresponding profit. (7marks)
- iii) The breakeven point(s) of production (7marks)

b) Watamu Ltd is a retailer of beer barrels. The company has an annual demand of 12,000 barrels. Fresh supplies can be obtained immediately but ordering costs and the cost of carriage inwards are sh 200 per order. The annual cost of holding one barrel in stock is estimated to be sh 12. Determine the Economic order quantity (EOQ) (4 marks)

QUESTION 4

a) Manukato LTD manufacturer's two products, Mrembo and Nukia. It has 3 machines A, B and C. Mrembo requires 2 minutes of machine A, 3 minutes of machine B and 1 minute of machine C. Nukia requires 3 minutes of machine A, 2 minutes of machine B and 1 minute of machine C. The capacity available is 1,500 minutes of Machine A 1500 minutes of machine B and 600 minutes of Machine C. The contribution per unit of Mrembo is sh.10 and Nukia is sh12.

- i) Formulate a linear programming model in standard form. (5marks)
- ii) Use the graphical method to determine the weekly production mix, that maximizes contribution (12marks)

b) State any 3 requirements of linear programming. (3marks)

QUESTION 5

- a) Kilunda construction company intends to undertake a project . The following information relates to the project.

Activity	Preceding activity	Duration (days)
A	-	20
B	-	16
C	A	8
D	C	16
E	B	20
F	B	20
G	D,E	16
H	F	12

Draw network project.

(8 marks)

Determine the critical path.

(2 marks)

Determine the shortest time duration the project.

(2marks)

- b)A project consists of FOUR contractors have submitted tenders for the jobs. The tender amounts . quoted in millions of shillings are given in the table below;
