MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2017/2018

FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION WITH INFORMATION TECHNOLOGY

CITY CAMPUS

ABA 107: MANAGEMENT MATHEMATICS I

Date:4ᵗʰ   May, 2018   Time: 5.30 – 8.30pm

INSTRUCTIONS:

- Answer Question ONE and any other TWO

QUESTION ONE (COMPULSORY)   (25 MARKS)

a) Discuss THREE applications of set theory in business.   (3 Marks)

b) Explain the reasons behind an individual time preference for money.

                                                           (3 Marks)

c) Describe under what circumstances , the following statements qualify as a set and as a class:

    i.   A park of wild animals

    ii.   A group of university students

    iii.   A bunch of rose flowers

    iv.   A sack of dry grains

    v.   A collection of musical instruments.   (10 Marks)

d) A revenue function is quadratic in nature. When $x = 5, R = 48$. Determine

    i.   The revenue function.   (2 Marks)

    ii.   The demand function. Hence the price when the quantity is $x = 5$ units.

                                                            (3 Marks)

QUESTION TWO   (15 MARKS)

A company is planning on producing and selling three products. The following table summarizes price and cost data for the three products.

	PRODUCTS		
	1	2	3
Selling Price (Kshs)	750	600	830
Variable cost/unit (Kshs)	500	400	670

Company officials estimate that the three products will sell in a mix such that 3 units of products 2 and 5 units of product 3 will be sold for each 2 units sold of product 1. If fixed costs are estimated at Kshs. 37 millions, determine the number of units of each product needed to breakeven.   (15 marks)

QUESTION THREE   (15 MARKS)

    a. In a particular life insurance office, employees Smith, Jones, William and Brown have "A" levels with Smith and Brown also having a degree. Smith, Melvin, William, Tyler, Moore and Knight are members of the ACII with Tyler and Moore having "A" levels. Identify set A as those employees with "A" levels, set C as those who are ACII members and set D as graduates,

Required:

    i.   Draw a Venn diagram representing sets A, D and C together with their elements.   (4 Marks)

    ii.   What special relationship exists between sets A and D?   (2 Marks)

iii. Specify the elements of the following sets and for each set, state in words what information is being conveyed by: $A \cap C$, $D \cup C$ and $D \cap C$. (4 Marks)

b. An object is dropped from a bridge which is 400 feet high. The height of the object can be determined as a function of time (since being dropped) according to the function: $h(t) = 400 - 16t^2$ where $h(t)$ is height in feet and t is time in seconds.

Required:

i. What is the height of the ball after 4 seconds? (2 Marks)
ii. How long does it take for the ball to hit the water? (3 Marks)

QUESTION FOUR (15 MARKS)

Determine how long it will take for a project whose today's value is 750,000 to be valued at 150,000 given that interest is charged at 4% per annum and interest is computed:

a. Annually (5 Marks)
b. Semi annually (5 Marks)
c. Quarterly (5 Marks)

QUESTION FIVE (15 MARKS)

Lamu Ltd has to choose which one of three projects to undertake. The cash Flows of each project would be as follows:

Year	Project X(Kshs)	Project Y(Kshs)	Project Z(Kshs)
0	(320,000)	(240,000)	(200,000)
1	80,000	120,000	60,000
2	80,000	100,000	60,000
3	120,000	100,000	60,000
4	120,000	80,000	60,000
5	30,000	(20,000)	60,000
6	-	-	60,000

The firm's cost of capital is 14% per annum.
Required:
Which project should be given priority based on payback and NPV methods?
(15 Marks)