



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF BUSINESS

UNIVERSITY EXAMINATIONS 2018/2019

**EXAMINATION FOR THE DEGREE OF BACHELOR OF
BUSINESS ADMINISTRATION AND BACHELOR OF COMMERCE**

BMS 4101: MANAGEMENT MATHEMATICS I

END OF SEMESTER EXAMINATIONS A

TIME: 2HOURS

DATE: Aug2019

Instructions to Candidates

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

You should have the following for this examination:

Answer Booklet, examination pass and student ID

QUESTION ONE

1(a) What is the compounded amount of Shs.14,000 after 4 years at 3% interest each half year.

[5 Marks]

b) If the population of Brazil is 80 Million and is decreasing at 2.4% per annum. What will be the population in 5 years' time?

[5 Marks]

c) What is the present value of receiving Shs. 1,000 in one years' time, Shs. 2,000 in two years' time and Shs. 8,000 in three years' time when the discount rate is 10%.

[5 Marks]

d) An investment project required an initial outlay, of £7,500 and will pay back £2,000 at each of the next five years. Is it worthwhile if capital can be invested elsewhere at 12%?

[6 Marks]

e) Solve the following

$$3x + 4y = 10$$

$$2x + 7y = 11$$

[4 Marks]

f) What is the straight line which has a slope $b = -5$ and goes through $(x,y) = (10,24)$

[5 Marks]

QUESTION TWO

Q. 2 a) Calculate the present value of a perpetual annuity of Shs. 48,000 at 12%.

[4 Marks]

b) Solve the following simultaneous equation

$$2y + 4x = 30$$

$$y + x = 9$$

[4 Marks]

c) In an arithmetic sequence, the first term is 3 and the common difference is 5.

i) Find the 13th term of the sequence

[4 Marks]

ii) Find the sum of the first 24 terms of the sequence

[5 Marks]

d) Find the 19th term of the series

9, 15, 21, 27.....

[3 Marks]

QUESTION THREE

Q. 3 a) What is the Straight Line which has a slope $b = -3$ and goes through $(x,y) = (18, 30)$

[4 Marks]

b) e) Evaluate $\text{Log}4^5$

$$= 5 \text{ Log } 4$$

[4 Marks]

c) Calculate the compound amount of Shs.6,000 after 5 years at 5%

[5 Marks]

d) Calculate the rate of interest when Shs. 580,000 investment now provides a perpetual annuity of Shs. 18,000 p.a.

[4 Marks]

d) Calculate the present value of a perpetual annuity of Shs. 94,000 at 12%

[3 Marks]

QUESTION FOUR

4 a) A firm sells a single product for \$80 per unit. Variable costs are \$ 30 for materials and \$36.00 for below. Annual fixed costs are \$100,000.

Required:

- i) Construct the profit function stated in terms of x, the number of units produced and sold.
- ii) Determine the profit earned if annual sales are 40,000 units.

i) Profit function

[4 Marks]

i) Profit if annual sales are 40,000 units during the year

[3 Marks]

d) Define the following terms as used in Business Mathematics

i) Break-even analysis

This is the point in your retail business where sales equals expenses.

ii) Inventory turnover

This is calculated by determining how many times during a given period that a business sells its inventory and replaces it.

(4Marks)

b) The rental income of Mrs. Omondi is Shs.220,000 per annum. The annual increment is Shs. 18,000 per annum.

i) Calculate the rental income at the end of the 7th year

[4 Marks]

ii) Calculate total earnings over this period

[5 Marks]

QUESTION FIVE

5. a) A company sets up a sinking fund and invests Shs. 45,000 each year for 8 years at 12% compound interest. What will the fund be worth after 8 years?

[4 Marks]

b) Evaluate $\frac{\text{Log}900}{\text{Log}200}$

[3 Marks]

c) Find the sum of all the number between 0 and 600 which are exactly divisible by 5.

5, 10, 15.....600 is an AP whose first term $a = 5$, common difference = 5

[5 Marks]

c) A company sets up a sinking fund and invests Shs. 60,000 each year for 5 years at 9% compound interest. What will the fund be worth after 5 years?

(4Marks)

(d)) Application of business Mathematics in business

[4 Marks]