CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF DEGREE
OF BACHELOR OF COMMERCE

BCOM 161: BUSINESS MATHEMATICS I

STREAMS: BCOM (Y1S1)   **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 11/4/2018   **11.30 A.M. – 1.30 P.M.**

INSTRUCTION: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

Q1.   (a)   Discuss the importance of mathematics in business.   [5 marks]

(b)   Solve the following quadratic equation by factorization $4x^2 - x - 3 = 0$

[5 marks]

(c)   Solve the following simultaneous equation

$5x + 9y = -30$

$6x + 2y = 28$ [5 marks]

(d)   Calculate the sum of the first ten terms of the sequence 4, 7, 10, … [5 marks]

(e)   A class of 79 students offers subject combination of mathematics, geography and economics. The following is the subject combination of the students

Subject combination	Number of students
Geography	41
Economics	26
Mathematics	30
Mathematics and economics	16
Geography and economics	6
Mathematics, geography and economics	2

Required:

(i)   Present the data in a Venn diagram

(ii)   Determine the number of students who take mathematics only and geography and economics only.   [10 marks]

2.   (a)   Using suitable examples, explain any five types of annuities.   [5 marks]

       (b)   MsJanes saved ksh 20,000 during the first year of her employment. In each subsequent year she saved 15% more than the preceding year wuntil she retired.

              Determine:

              (i)   How much she saved in the third year

              (ii)   The total amount she had saved after 20 years of service.   [9 marks]

       (c)   Kamwana deposited ksh 500,000 in a bank account that earns interest at the rate of 10% per annum for the first two years and 12% for the next three years. Calculate the interest earned by the end of the fifth year.   [6 marks]

3.   (a)   The fourth term of a Arithmetic progression is 18, and the common difference is - 5. Calculate the first term and the sum of the first sixteen terms.   [7 marks]

       (b)   The forth term of a geometric progression is 16. If the first term is 2 calculate the common ratio and the seventh term.   [7 marks]

       (c)   A committee containing 5 men and 6 women is to be formed from 7 men and 9 women. In how many different ways can this be done?   [6 marks]

4.   (a)   Expand $(2 - x)^6$ in ascending powers of x. by taking $x = 0.002$ and using the first three terms of the expansion, find the value of $(1.998)^6$ as accurately as you can 5dp.   [7 marks]

       (b)   Evaluate the following without using any mathematical tables

              $\log_2 \left(\frac{4}{7}\right) + \log_2 \left(\frac{3}{2}\right) - \log_2 \left(\frac{3}{14}\right)$ [6 marks]

       (c)   Finds the equation of a straight line that is perpendicular to $A(2, 4)$ and $B(1, 1)$ and passes through point A.   [7 marks]