TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN BUILDING AND CIVIL ENGINEERING

AMA 1150 : ENGINEERING MATHEMATICS I

END OF SEMESTER EXAMINATION

SERIES:AUGUST2019

TIME:2 HOURS

DATE:2019

Instructions to Candidates

You should have the following for this examination:

Answer Booklet, examination pass and student ID

This paper consists of five questions.

Attempt any THREE questions

Do not write on the question paper.

QUESTION ONE

a). Evaluate the following without using tables

(i) $\log_{8/9}(64/81) = x$

(ii) $\log_{15}1 = x$

(iii) $\log_{64}(2x-5) = x$ **(6mks)**

b). Use the completing square method to solve $2x^2 + 9x - 5 = 0$. **(8mks)**

c). Solve $x^2 + 5 = 6x$ by factorization method. **(6mks)**

QUESTION TWO

a). Show that the data:

x	1	2	3	4
y	0.25	2	6.75	16

a) Satisfies a law of the form $y = x^3 + b$ and find the values of the constant.

(15mks)

b). Find the value of y when x = 2.6 and x when y = 10.5 **(5mks)**

QUESTION THREE

a). Find the sum of the following series:

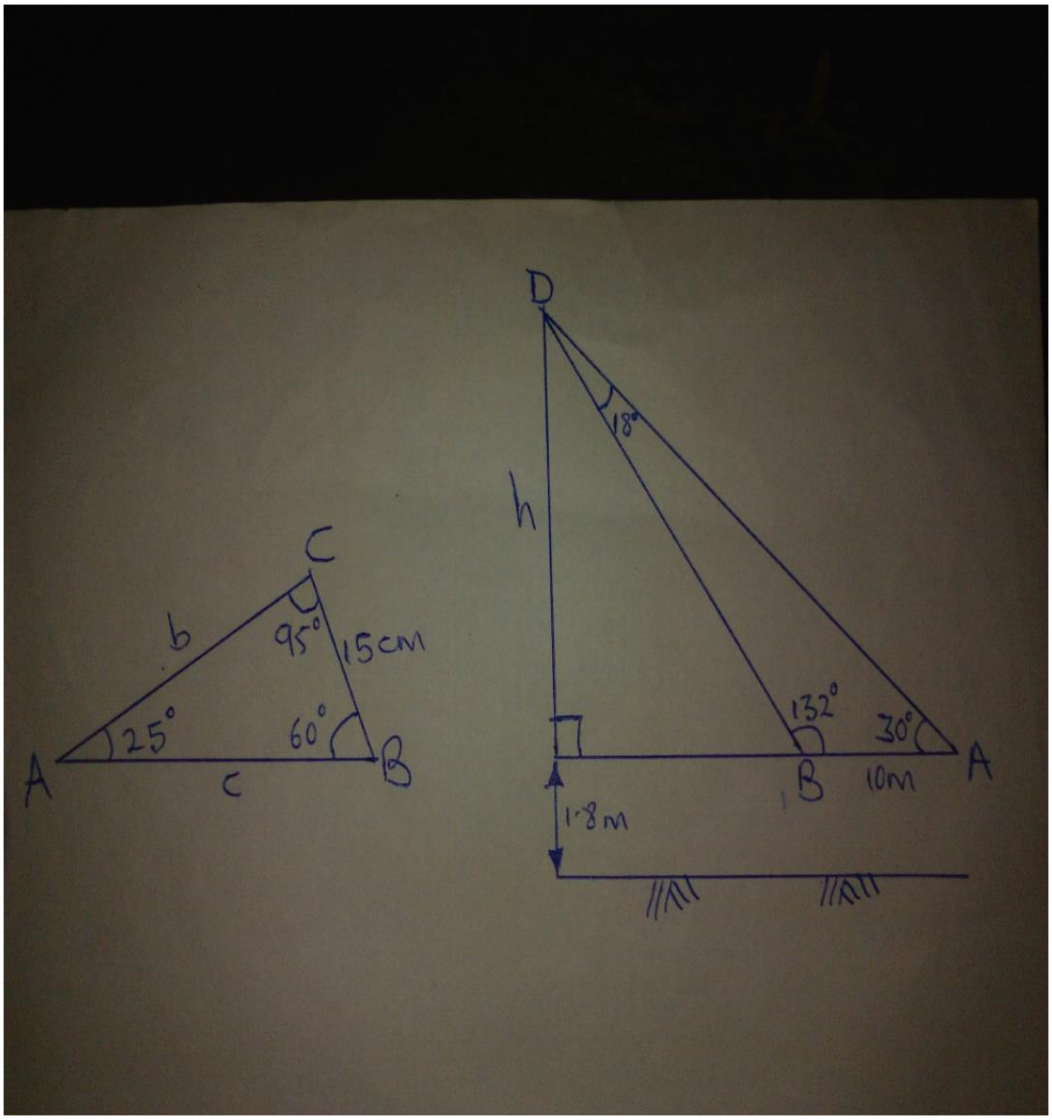
$3 + 4.5 + 16 + \ldots\ldots$ upto 12^{th} term. **(6mks)**

b). In an A.P the sum of 15 terms is 555. If the common difference is 4, find the first and fourth terms. **(4mks)**

c) Find THREE numbers in a geometric progression such that their sum is 26 and their product is 216. **(10mks)**

QUESTION FOUR

a). Determine the value of b, c and h in the following figures. **(8mks)**



b) Show that Sin(A+B) = SinACosB + CosASinB. **(12mks)**

QUESTION FIVE

a) Show that Tan $75^{o} = \frac{1+\sqrt{3}}{\sqrt{3}-1}$ **(8mks)**

b) Show that Tan(A+B) = $\frac{\text{TanA+TanB}}{1-TanATanB}$ **(12mks)**