JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF MATHEMATICS AND ACTURIAL SCIENCE

UNIVERSITY EXAMINATION FOR DEGREE OF B.sc. (CUMMUNITY HEALTH AND PUBLIC HEALTH)

1ST YEAR SEMESTER 2018/2019 ACADEMIC YEAR

KISUMU LEARNING CENTRE

COURSE CODE: SMA 3111

COURSE TITLE: MATHEMATICS I

DATE : 14/08/2019 **EXAM SESSION: 2.00 – 4.00 PM**

TIME : 2 HOURS

Instructions

1. **Answer question One (compulsory) and ANY other two questions**
2. **Candidates are advised not to write on the question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION ONE COMPULSORY (30 MARKS)

a) Solve the equation

$2x^2-5x-3 = 0$ using the method of completing square (5marks)

b) Ten casual labourers were hired by a garment factory for one week and paid in shillings, according to productivity of each , as below

615, 633, 720, 509, 633, 710, 614, 630, 633, 720

Find the,

i. Mean
ii. Mode
iii. Median for the data (5 marks)

c) Find the coefficient of

X^2y^2 in the expansion of

$(2x+3y)^4$ (5 marks)

d) Simplify by rationalizing the denominator $\frac{2}{\sqrt{5}+\sqrt{2}}$

e) Given that U= {a, b, c, d, e, f, g}, A= {a, c, e, f} , B= {c, d, e} C= {e,f,g}

Find,

i. $(BnC)^1$ (2 marks)
ii. $(AnB) u C^1$ (2 marks)

f) Solve

$4^{5x} \div (2^{3x})^2 = 256$ (5 marks)

QUESTION TWO (20 MARKS)

a) Mr. Aden ones a financial institution Shs. 300,000, towards which he pays Sh. 80,000 every year. If the interest charged is at 12% p.a on the outstanding balance. Find

i) The time it will take him to clear the loan (3mks)

ii) The total interest paid (3mks)

b) The fourth term of a geometric sequence is 192. If the first term of the sequence is 3, find

i) The common ration (4mks)

ii) The sum of the first five terms of the G.P (4mks)

iii) The length term (T_8) (3mks)

iv) The number of terms that will give a sum of 255 (3mks)

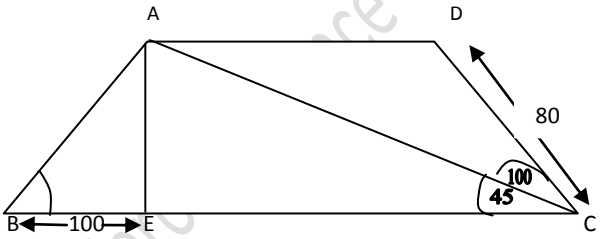
QUESTION 3 (20 MARKS)

a) Given that x° is an angle in the first quadrant such that $8\sin^2 x + 2\cos x - 5 = 0$, find

i. Cos x (3 marks)

ii. Tan x (3 marks)

b) The figure below represents a quadrilateral piece of land ABCD divided into three triangular plots. The lengths BE and CD is 100m and 80m respectively. Angle ABE = 30°, angle ACE = 45° and angle ACD = 100°



Find to four significant figures

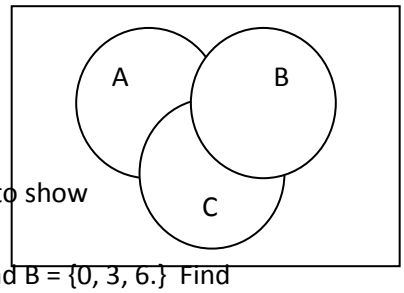
i. The length of AE (4 marks)

ii. The length of AD (3 marks)

iii. The perimeter of the piece of land (3 marks)

QUESTION FOUR (20 MARKS)

a) The figure below shows a Venn diagram, shade the region corresponding to the given expression.



i. $(A^1 n B) \cap C^1$ (4 marks)

ii. Draw a Venn diagram to show

a) $(A \cap C^1) \cup B^1$ (4 marks)

b) Let A = {1, 2, 3, 4, 5} and B = {0, 3, 6.} Find

i. AuB (3 marks)

ii. B-A (3 marks)

c) Let $f_1 = x + 2x^3$ and $f_2 = x^4 - x^3 + 2$ be a function from A to R. find

i. $f_1 + 2f_2$ (3 marks)

ii. $f_1 f_2$ (3 marks)

QUESTION FIVE (20 MARKS)

The data below show masses of 50 potatoes

Mass(g)	25-34	35-44	45-54	55-64	65-74	75-84	85-94
No. of potatoes	3	6	16	12	8	4	1

Using an assume mean of 59.5, calculate

a)

i. The mean

ii. Variance

iii. Standard deviation (12 marks)

b) Draw an ogive curve from the above data and estimate the median mark. (8 marks)