JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF HEALTH SCIENCES

UNIVERSITY EXAMINATION FOR THE CERTIFICATE IN COMMUNITY HEALTH AND DEVELOPMENT

1ST YEAR 1ST SEMESTER 2023/2024 ACADEMIC YEAR

KISUMU CAMPUS.

COURSE CODE: SMA 1111
COURSE TITLE: MATHEMATICS

EXAM VENUE:	**STREAM : Certificate Comm. Health n Dev.**
DATE:	**EXAM SESSION:**
TIME:	**1.30 HOURS**

Instructions:

1. **Answer all questions in section A and any other 2 questions in Section B.**
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 A: ANSWER ALL QUESTIONS IN THIS SECTION

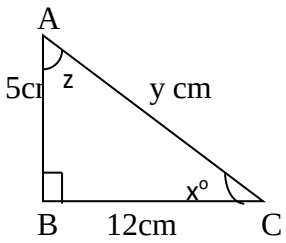
1. Define the following (3marks)
   a) A set
   b) Sub set
   c) Equal set
2. A set A is defined as A= {a, b, c}. Determine the power set of A. (3marks)
3. Solve the quadratic equation below.(3marks)
   $2x^2 - 3x + 1 = 0$
4. Determine the mean, mode and median of the following data. (3marks)
   12, 11, 14, 17, 24, 19, 21, 10, 26, 24
5. A line L passes through 3,4 and is parallel to another line N whose equation is 3y+7x=10. Determine the equation of line L. (3marks)
6. Evaluate (3marks)
   $\frac{\log 243 + \log 27 - \log 81}{\log 9}$
7. Use completing square method to solve $4x^2 = 12x + 28$ (3marks)
8. The second term of an A.P is 11 and the fifth term is 26. Determine the sum of the first 10 terms of the series. (3marks)
9. Determine the value of x (3marks)
   $x^2 - 5x + 6 = 0$ by factorization method
10. Simplify: $\frac{6-4}{3-\sqrt{5}}$ by rationalizing the denominator (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (30MARKS)

1. Given set A { 1, 2, 3} B { 1, 2, 3, 5 } C { 3, 7, 8}

Find
a) A u B (2marks)
b) A n B (2marks)
c) A/B (2marks)
d) (A u B)nC (2marks)
e) (A n B) UA/B (2marks)
f) Present (AnB)U A/B in Venn diagram (5marks)

2. Given Triangle ABC



a) Find A – C in cm (2marks)

b) Find Angle x (2mks)

Angle z (2marks)

c) Express in logs

i) $27 = 3^3$ (3mks)

ii) $64 = 8^2$ (3mks)

iii) Solve

$3^7 \text{ X } 3^8/3^3$ (3mks)

3. In a class of 50 students, a survey was conducted on the number of times each student had visited VCT centre for HIV testing and counseling since they attained the age of 18. The following were the responses obtained from each student.

22 ; 46 ; 35 ; 68 ; 67 ; 49 ; 55 ; 44 ; 23
44 ; 29 ; 35 ; 34 ; 42 ; 37 ; 40 ; 42; 46
41 ; 30 ; 59 ; 62 ; 26 ; 47 ; 45 ; 37; 38
23 ; 29 ; 56 ; 51 ; 38 ; 35 ; 43 ; 47; 43
46 ; 45 ; 61 ; 53 ; 52 ; 55 ; 48 ; 45; 52

i. Using classes of 20-29, 30-39 … up to 60-69. Construct a frequency distribution table. (5mark)
ii. From the frequency distribution table made in a. (i) above;
Determine the mean, the median, variance and the standard deviation of the frequency of the visits. (10 marks)

4. a) Below is an arithmetic progression.
60+57+…..+18
(i) How many terms are there in the progression? (2 marks)

(ii) What is the sum of the terms in the progression? (2 marks)

b) A progression has a second term of 48 and a fourth term of 27. Find the first term of the progression in each of the following cases:
(i) The progression is arithmetic (2 marks)
(ii) The progression is geometric with a positive common ratio. (3 marks)

c) The fifth term of a geometric progression is 24 and the ninth term is 384.
All the terms are positive.
(i) Find the common ratio. (2 marks)
(ii) Find the first term. (2 marks)
(iii) Find the sum of the first ten terms. (3 marks)

SMA 1111: MATHEMATICS I 42 Hours

Course Purpose

Expected Learning Outcomes

Content

Introduction: Elementary set theory and Venn diagrams. Relations and functions: Definitions; domains; codomains; range; inverse of a function and composition of functions. Trigonometry: Functions; their graphs; sine and cosine formulae; trigonometric identities and equations. Algebra: Quadratic equations; Surds, logarithms and indices. Sequences and Series: Arithmetic and geometric progressions; Permutation and combinations; Binomial theorem and applications such as approximations, simple and compound interest. Statistics: Collection and representation of data; Introduction to measures of central tendencies and variability.

Teaching and Learning Methods

- Lectures
- Self-directed learning
- Group discussions
- Individual and Group Assignments
- Field visits

Instructional Material and Equipment

28

Textbooks, Journals, Handouts, Computers and multimedia technology and equipment

Assessment and Examinations

Type weight

Continues Assessment Tests 40%

Examinations 60%

Textbooks and Journals