JARAMOGI OGINGA ODINGA UNIVERSITY

OF SCIENCE & TECHNOLOGY

UNIVERSITY EXAMINATIONS 2012/2013

1ST YEAR 1ST SEMESTER EXAMINATION FOR THE

DIPLOMA IN COMMUNITY HEALTH AND

DEVELOPMENT

(KISII)

COURSE CODE: SMA 2111

COURSE TITLE: MATHEMATICS I

DATE:12/8/2013   **TIME: 2.00-3.30 PM**

DURATION: 1.30 HOURS

INSTRUCTIONS

1. This paper consists of two sections A and B.
2.   Answer Question 1 (Compulsory) and any other 2 questions.
3. Write your answers on the answer booklet provided.

QUESTION 1 (30 MARKS).

(a) In how many ways can a party of 12 children be divided into two groups?   (2mks)
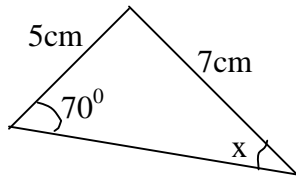
(b) If A = $\{3, 4\}$ B = $\{2, 4, 6, 8\}$ and

   C = $\{3, 6, 8, 10\}$. Find A (B   C)   (4mks)

(c) Applying the mapping x $\longrightarrow$ ½ x to the domain $\{0, 1, 2, 3, 4\}$ list the
   Range. Suggest a co-domain.   (4mks)

(d) If f (x) = 3x – 2, find its inverse   (4mks)

(e) Find the angle x in the given triangle.   (3mks)

(f) Define the word median as used in statistics and use the definition to calculate the median of the following set of data.   (4mks)

        13, 16, 20, 25, 30 , 40

(g) Find the next three terms of the following sequence.   (3mks)

   $\frac{1}{3}$, $\frac{1}{9}$, $\frac{1}{27}$ _____ _____ _____

(h) If 4^{2x} = 16, find the value of x.   (3mks)

(i) Solve the equation Cos x = $\sqrt{3}$, for values of x such that 0^0 x 360^0 (3mks)

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2 (a) (i) Copy and complete the following table for y = sin x   (3mks)

X	0	30	45	60	90	120	135	150	180	210	225	240	270	300	315	330	360
Y	0	0.5			1.00				0				-1.00			-0.50	0

(ii) Draw the graph of y = sin x and use your graph to find approximate solutions to the equation sin x = 0.2 for 0^0 x 360^0 (7mks)

(b) Find the simple interest that would accrue when a welfare group leads to a member Kshs. 15,000 at the rate of 12% in three years.   (5mks)

(c) The sum of the first three of a geometric series is 26. If the common ratio is 3, find the sum of the first six terms.   (5mks)

QUESTION 3: (20 MARKS)

3(a) A group of young men decided to raise Kshs. 480,000 to start a business. Before The actual payment was made, four of the members pulled out and each of these remaining had to pay an additional Kshs. 20,000. Determine the original number of members.   (10mks)

(b) Rationalize and simplify the denominator in $\dfrac{2 \sqrt{3}}{7 - \sqrt{5}}$ (5mks)

(c) Solve for x in log x + log 5 = log 30.   (5mks)

QUESTIONS 4 (20 MARKS)

4. (a) (i) The data below shows marks obtained by 20 students in an essay:

9, 5, 5, 4, 5, 3, 5, 11, 6, 3, 6, 8, 9, 6, 13, 8, 8, 13, 5, 10.

Prepare a frequency distribution table   (5mks)

(ii) Using the table, calculate the mean score   (3mks)

(iii) State the mode   (2mks)

(b) The table below shows the number of letters collected from the post office by a school driven during a school year.
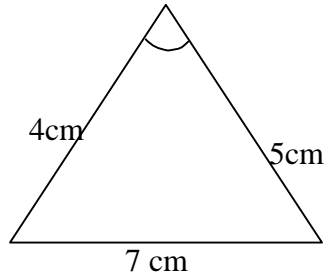
Letters per day	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50
Frequency	2	4	6	4	5	7	3	6	7

Draw a histogram to represent this information   (10mks)

QUESTION 5 (20 MARKS)

5. (a) Expand $(1 + x)^9$ up to the term in x^3. Use the expansion to estimate $(0.98)^9$.
(6mks)

(b) Find the angle   in the given triangle   (5mks)

4cm   5cm   7 cm

(c) Solve the quadratic equation $6x^2 + 13x + 6 = 0$.   (4mks)

(d) Find the amount at the end of the fourth year if Kshs. 30,000 is deposited at 15% p.a compound interest.   (5mks)

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