Machakos university

School of pure and applied sciences

Department of mathematics and statistics

First second semester examination for certificate in B.C.E and plumbing.

Mathematics

Instructions

Answer all the questions

show your working clearly.

Question one

a) Solve the following equations (16 marks)

i) $2^{2x-3} = 4^{x+3}$

ii) $\frac{4^{2x} \times 8^{x}}{2^{x}} = 64$

iii) Log(x+6)-log(x-3) =1

iv) 2x-3y=7

4x+3y=5

b) Determine the LCM of36,45 and 60 (4 marks)

Question two

a) Evaluate,

i)Log96+3log5-log12

ii)$\frac{1}{2}\left\{\frac{3}{5}+\frac{1}{4}\left(\frac{7}{3}-\frac{3}{7}\right)\right\} of\ 1\frac{1}{2} \div 5$ (10 marks)

b) Make l the subject of the formula

$$\frac{2l}{l+rcR} = m$$

Hence calculate the value of L when m=$\frac{1}{2}$ r=3, c=4, R=5

c) Express 3.280843 m in

i) Cm

ii) Km

iii) Correct to 2 s.f. (3marks)

Question three

a) The fourth term of an A.P is 14 and the sum of the first six terms is 69. Determine the:

i) First term
ii) Common difference
iii) Sum of the first sixteen terms. (9marks)

b) If the median of the numbers 25, x, 16, 12,24 and 14 is 18, find x.

c) The table below shows the number of goals scored by a team in 15 matches.

score	0	1	2	3	4	5	6
frequency	1	0	3	2	5	3	1

Determine

i) The mean
ii) The mode
iii) The median

Question four

a) Solve the following equations

i)$x^2 + 15x + 50 = 0$

ii) $3^{x+1} = 2^{2x-3}$ correct to 2 decimal place

b) John borrowed sh 75,000 for two years. The rate of simple interest for the first year was 9.75%, but for the second year the rate increased to 11%. How much more interest he paid in the second year than in the first year (5 marks)

Simplify

i) $\frac{2x-3}{3} - \frac{x-2}{2} - \frac{1-x}{4}$

ii)$\text{Log}_e 3$

Question five

a) Express the first quantity as a fraction of the second quantity (6marks)

i) 45 seconds: I hour

ii) 450g: 2kg

b) Express $0.1\dot{8}$ as a fraction (3marks)

c) Draw the graph of $y= -x^2+5x+2$ for values of x from -3to 7; hence use the graph to solve the following equations (11marks)

$-x+5x+2=0$

$3+x-x^2=0$