THE PRESIDENT'S OFFICE
REGINAL ADMINISTRATION AND LOCAL GOVERNMENT
CHAMWINO DISTRICT COUNCIL

PRE – NATIONAL EXAMINATION SEPTEMBER – 2019

MATHEMATICS FORM FOUR
TIME: 3: 00Hours

INTRODUCTION

- This paper consist of two sections A and B
- Answer **all** questions in **both** sections A and B
-Each question in section A caries 6 marks while each question in section B caries 10 marks
-All necessary working and answers for each question done must be shown clearly.
- Mathematical tables and graph papers may be used where necessary
- All unauthorized materials of the subject are **not** allowed in the examination room
- Where necessary use the following constants

Radius of earth R = 6370km

$\pi = 3.14$

SECTION: A (60 MARKS)

Answer all questions in this section

1. (a) If k =0.23 and L = 0.3, express k and L in the form of a/b if b ≠0. Then Find the value of

(i) 2k +L

(ii) k - $^{1}/_{2}$ L

(b) Write 60098 in the form of $Ax10^{n}$ where $1 \leq A < 10$

2. (a) Simplify the following expressions

(i) $(3+\sqrt{2}¿ (4-2\sqrt{2})$

(ii) $27^{\frac{1}{4}} \times 3^{\frac{1}{4}} \times (\sqrt{3})^{-2}$

(b) If n $\log_5 125$ = $\log_2 64$, find the value of n

3. (a) Given a universal set u and the two sets A and B are such that;u=$\{X : 2 < X \leq 10\}$

A= $\{X : 2 < X \leq 7\}$ and B=$\{X : 4 < X \leq 8\}$.By listing method find

i, AUB ii,AnB

(b) (i) In a family of four children draw a tree diagram to illustrate all the possible outcomes of the children

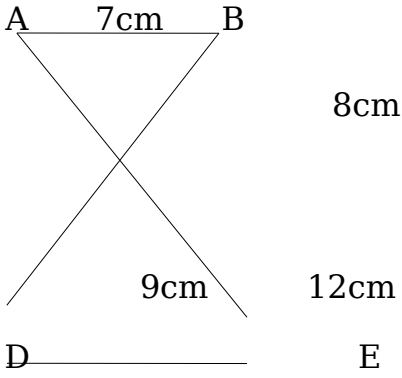
(ii) Use the drawing in part (i) above to find the probability of getting at least one girls

4. (a) if a=3i-j and b=5i-2j and c=4a+b
Find i, The magnitude of c
ii, The direction of c
iii, The unit vector in the direction of c

(b) Find the equation of the line which is perpendicular bisector to the line $\overline{AB}$ given that A (2,3) and B (4,2).

5. (a) The area of regular six sided plot of land inscribed in a circular track of radius 'r' is 720 m^2. Calculate the radius of the track. (Express your answer in the nearest whole number).

(b) From the diagram write down pair of similar triangles. Hence find the length of DE.



6. (a) If y^2 varies directly to x -1 and inversely to x+d. If x=2, d =4 then y =1. Find value of x when y=2, and d= 1

(b) A piece of cloth is 37 $^1/_2$cm long and is cut into equal pieces each of $1^1/_2$cm long. How many pieces can be obtained from the cloth?

7. (a) Mr. Tegeko invested six millions in the CRDB Bank at the interest rate of 10% compounded annually. Find the total amount which he will receives after three years.

(b) From the information below determine the gross profit

Sales = 38,000

Opening stock = 8,000

Purchases = 25,000

Electricity = 4,000

Discount allowed = 2,000

Closing stock = 500

8. (a) Write down the nth term of the sequence ½, ⅔, ¾ and hence find the 20^{th}term.

(b) Find the first term and common ratio of a Geometric progression whose third term is 3 and eight terms is - 96

9. (a) In ▲ABC $\hat{B}$= 53^0, side a =9cm and side c =5cm. Find the value of side b

(b) From the top of the tower the angle of depression of a point on the ground 100m away from the base of the tower is 60^0how high is the tower?

10. (a) If the sum of two numbers is 8 and the sum of their square is 40. Find these numbers

(b) Use a quadratic formula to solve $2x^2 + x = 10$

SECTION: B (40 MARKS)

Answer All Questions in this section

11. (a) The following table shows the scores of sixty students in a Basic mathematics test

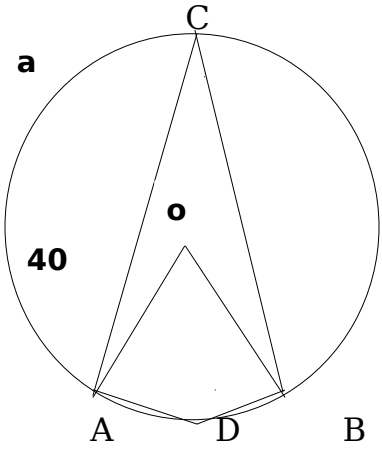
Scores	Frequency
01 -10	5
11 -20	7
21-30	15
31 - 40	25
41 - 50	8

Calculate (i) The mean score if the assumed mean is obtained from the mid mark of the modal class

(ii) The median

(iii) The range of the scores

(b)



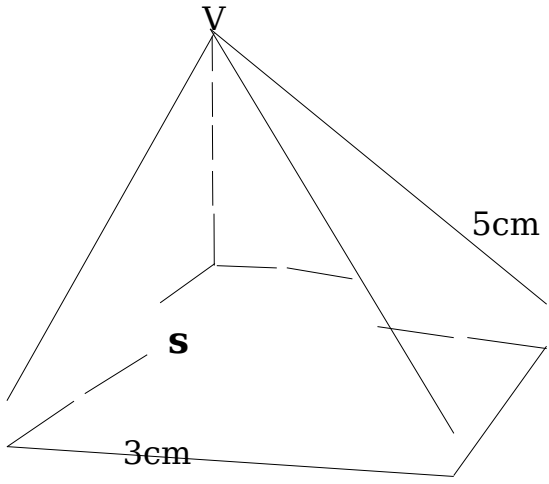
In the figure above;0 is the centre of the circle. Find the value of angles marked 'a' and 'b'

12. (a) An Aeroplane leaves the point x(43^0N, 71^0w) and flies east at 500km /h for 3 hours

(i) How far had it travelled?

(ii) What is its new latitude and longitude?

R



P 4cm

Q

A rectangular base pyramid VPQRS above is such that $\overline{VP} = \overline{VQ} = \overline{VR} = \overline{VS}$ = 5cm, PQ = 4cm and QR = 3cm. Find the angle between VP and PQRS.

13. (a) If L= $\begin{bmatrix} 0 & 2X \\ X & 0 \end{bmatrix}$ Find x given that ILI = -8

(b) Solve by matrix method the simultaneous equations

5x + 9y = 8

-3x + 5y =12

(c) If M= $\begin{pmatrix} \cos 2x & \sin 2x \\ \sin 2x & \cos 2 \end{pmatrix}$ is the matrix of reflection in the line inclined at x=135^0,U= (6,1) and t=4 Find M(t u).

14. (a) Sketch the graph of g(x) such that;

g(x)= $\begin{cases} x\,; for\, x \leftarrow 2 \\ 2\,; for -2 \leq x \leq 2 = \\ x+1\,; for x > 2 \end{cases}$

then Findg (-1) and g(3)

(b) A manager of plantation wants to plant wheat and pyrethrum. Whets needs 3 men per hectare and pyrethrum needs3 men per hectare also. He has 48

hired labourers available. To maintain a hectare of wheat, he needs 250 shillings and a hectare of pyrethrum needs 100 shillings. Find the greatest possible number of hectares of the land he can plant the two crops if he is prepared to use 2500 shillings.