Name……... **Index No** ……...

Candidate's Signature …….

Date: ……...

121/1
MATHEMATICS
PAPER 1
JULY/AUGUST 2014
TIME: $2^1/_2$ HOURS

NYAMIRA SUB-COUNTY JOINT EVALUATION EXAM

Kenya Certificate of Secondary Education (K.C.S.E)

121/1
Mathematics
Paper 1
$2^1/_2$ hours

INSTRUCTIONS TO THE CANDIDATES

- *Write **your name** and **index number** in the spaces provided above*
- *This paper contains two sections; **Section** 1 and **Section 11**.*
- *Answer all the questions in **section 1** and only **five** questions from **Section 11***
- *All workings and answers must be written on the question paper in the spaces provided below each question.*
- *Marks may be given for correct working **even if** the answer is wrong.*
- *Non programmable silent electronic calculators and KNEC Mathematical tables may be used **EXCEPT** where stated otherwise.*
- *Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.*

FOR EXAMINERS'S USE ONLY

Section 1

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Marks																	

Section 1I

Question	17	18	19	20	21	22	23	24	**Total**
Marks									

GRAND TOTAL

This paper consists of 14 printed pages. Candidates should check carefully to ascertain that all the pages are printed as indicated and no questions are missing.

SECTION I (50 MARKS)

Answer all questions in the spaces provided.

1. Evaluate using logarithm (4mks)

$$\sqrt{\frac{4.283x(0.009478)^2}{\log 9.814}}$$

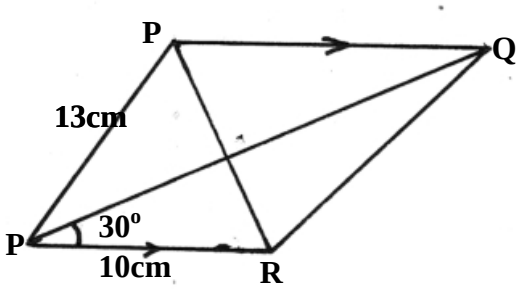
2. The volumes of two similar cylinders are 4752cm3 and 1408cm3. If the area of the curved surface of the smaller cylinder is 352cm2, find the area of the curved surface of the larger cylinder (3mks)

3. The radius of a cone is given as 4.2cm while its height is given as 9.7cm. find the percentage error in the estimation of the volume of the cone (4mks)

4. A line Ax +3y-6=0 is perpendicular to the line 5x+7y-k=0. If 5x+7y-k=0 passes through the point (4,3). Determine the values of A and K. (4mks)

5. Factorise $90x^2 - 40y^2$ (2mks)

6. In the figure below PS=PR PS=13cm, RS=10cm and $\angle QSR=30^o$. Find the length of QS (3mks)



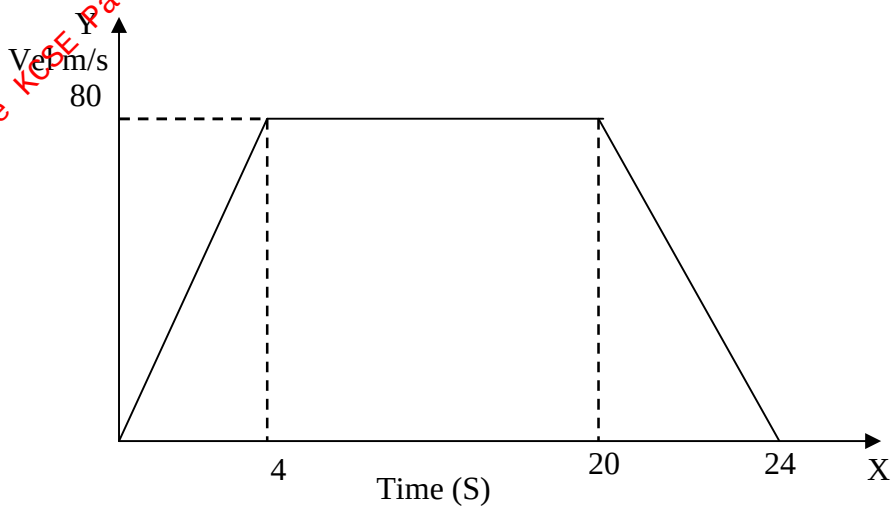
7. Solve for x and y in the simulataneous equations given below (3mks)
21x-12y=-29
12x+5y=19

8. The resistance to the motion of a car is partly constant and partly varies as the square of the speed. At 40km/h^{-1} the resistance and at 60kmh^{-1} it is 730N. what will be the resistance at 70kmh^{-1} (4mks)

9. Without using a calculator or mathematical tables find the value of $\frac{0.0060x2.4x0.3^2}{0.9x0.00015x160}$ (3mks)

10. A contractor was to finish a piece of work in 80 days. He employed 150 workers to work for 6 hours a day. After 30 days he found out that only a quarter of the work had been done. How many more workers did he require to finish the work in time (3mks)

11. The figure below is a velocity time graph of a car



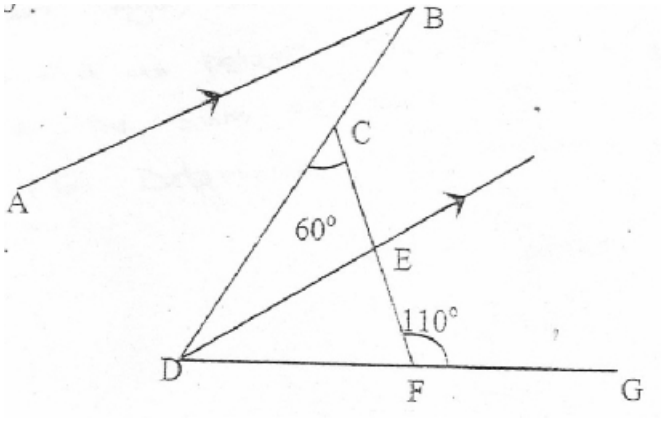
(a)Find the total distance travelled by the car (1mk)

(b) Calculate the deceleration of the car (2mks)

12. Find the range values that satisfy the inequality (2mks)
$x-4 \leq 3x+2 \subset 2(x+5)$

13. A blouse whose marked price is Sh.800 is sold to a customer after allowing him a discount of 13%. If the trader makes a profit of 20%, find how much the trader paid for the shirt (2mks)

14. In the figure below, AB is parallel to DE, DE bisects angle BDG, angle DCF=60^o angle CFG=110^o



Find

(a) ∠CDF (2mks)

(b) ∠ABD (2mks)

Give reasons for your answers

15. Three years ago, James was three times as old as his Peter. In five years time, the sum of their ages will be 76. Determine their present ages (3mks)

16. Given that OA= $\underset{\sim}{i} + 2\underset{\sim}{j}$ and OB= $2\underset{\sim}{i}-3\underset{\sim}{j}$. Find the magnitude of AB to three significant figures (3mks)

SECTION B (50 MARKS)

Answer ONLY FIVE questions in this section in the spaces provided

17. A cold water tap can fill a bath in 3 minutes while a hot tap can fill in 5 minutes. The drain pipe can empty the bath in 3 ¾ minutes. The two taps and the drain pipe are fully open for 2 minutes, after which the drain pipe is closed.

(a) What fraction of the bath is filled after the first two minutes (3mks)

(b) How many seconds are required for the bath to be completely filled? (3mks)

(c) Given that the cold water tap delivers water at the rate of $200cm^3/s$

Determine

I. The capacity of the bath in litres (2mks)

II. The rate of flow of the hot water tap (2mks)

18. Four towns A,B,C and D are such that B is on a bearing of 247^{o} and 6km from A. C is due SSE and 4.8km from B. D is to the south of A and the bearing of C from D is S44^{o}W

(a) Make a scale drawing showing the relative positions of A,B,C and D using the scale 1cm represents 1km (4mks)

(b) Use your drawing to determine

(i) The bearing of A from C (1mk)

(ii) The distance between C and D (1mk)

(iii) How far D is east of B (1mk)

(c) The average speed of a cyclist from C to A if he takes 30 minuets between A and D and 20 minutes between D and A (3mks)

19. A passenger train travelling at 25km/hr is moving in the same direction as the truck travelling at 30km/hr. the railway line runs parallel to the road and the track takes 1 ½ to overtake the train completely

(a) Given that the truck is 5 metres long determine the length of the train in metres (6mks)

(b) The track and the train continue moving parallel to each other at the original speeds. Calculate the distance between them after 4 minutes and 4 seconds after the track overtake the train (2mks)

(c) The track stopped 45 minutes after overtaking the train. How long did the train take to catch up with the truck (2mks)

20. The probability of Onyancha, Nyamusi and Jemima hitting the bull's eye are $\frac{1}{5}, \frac{3}{10}$ *and* $\frac{2}{3}$ respectively.

(a) Draw a probability tree diagram showing this possible outcomes (2mks)

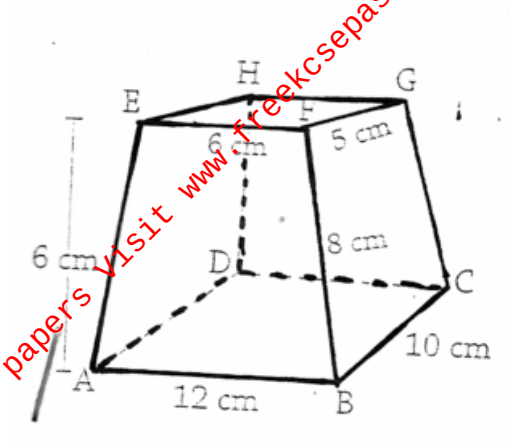
(b) Find the probability that;

(i) All hit the bulls eye (2mks)

(ii) Only one of them hit the bull's eye (3mks)

(iii) At most one misses the bull's eye (3mks)

21. The figure below is a solid frustrum of a rectangular based pryramid AB=12cm, BC=10cm, EF=6cm FG=5cm, FB=8cm and vertical height 6cm.

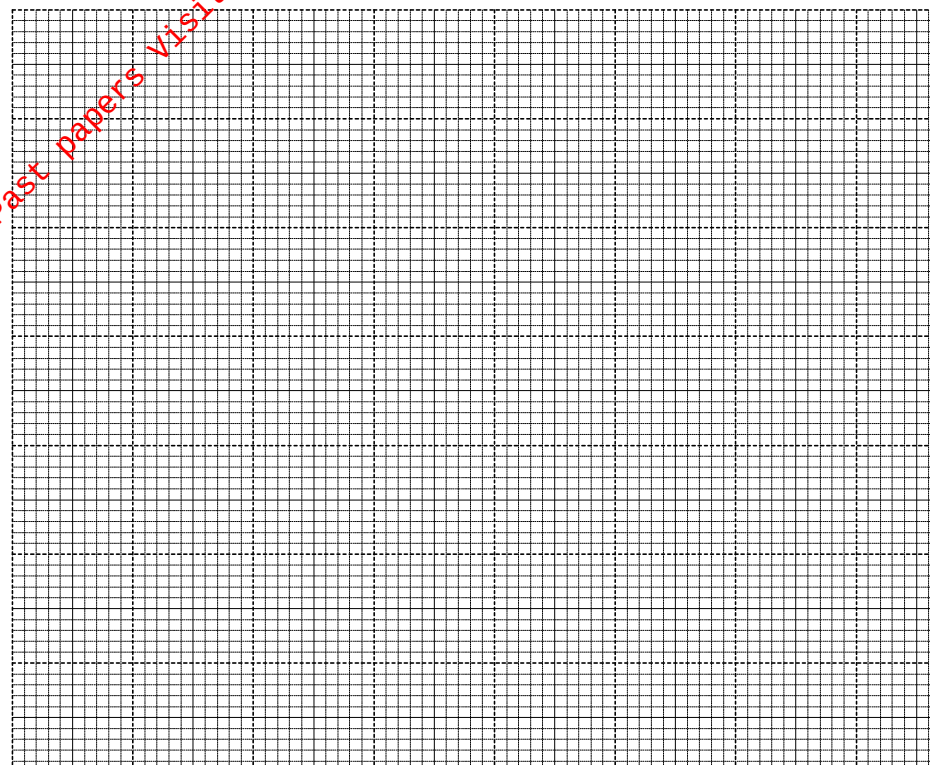


(a) Calculate the volume of the frustrum (5mks)

(b) Calculate the surface area of the frustrum (5mks)

22. The points P(1,5) Q(2,2) R(4,1) and S(4,2) are vertices of a quadrilateral PQRS

(a) On the grid provided, draw the quadrilateral PQRS (2mks)



(b) On the same grid draw P1Q1R1S1 the image of PQRS under a rotation of positive quarter turn about the origin. State the co-ordinates of P1Q1R1 and S1 (3mks)

(c) The point P11Q11R11S11 are the images of P1Q1R1S1 under a reflection in the x-axis. On the same grid draw quadrilateral P11Q11R11S11 and state its co-ordinates (3mks)

(d) Quadrilateral P11Q11R11S11 is the image of PQRS under a certain reflection. On your graph draw the mirror line LL for the reflection and state its equation (2mks)

23. (a) Complete the table below by filling in the blank spaces for the functions $y=\sin(x+30)$ and $y=\cos \frac{1}{2} x$ and draw their graphs on the same axes (7mks)

x	0	30	60	90	120	150	180	210
Y= sin (x+30o)	0.5		1		0.5			-0.87
Y= cos ½ x	1.00			0.71			-0.50	

(b) Use your graph to solve

(i) $\sin(x+30)-\cos \frac{1}{2} x=0$ (1mk)

(ii) $\sin(x+30)=0$ (1mk)

(iii) $\cos \frac{1}{2} x=-0.25$ (1mk)

24. Points A,B,C have the co-ordinates (3,1)(8,2) and (2,6) respectively

(a) Find the mid points of AB and AC (3mks)

(b) Determine the equations of the perpendicular bisector of AB and AC (3mks)

(c) Hence or otherwise determine the equation of a circle which passes through the points A, B and C (4mks)