ALLIANCE HIGH SCHOOL
END OF TERM 1 2016
MATHEMATICS EXAM
FORM THREE

NAME_____ADM.N._____CLASS_____

Duration 2 hrs 30 min

Section A :Answer all questions in this section (50mks)

1. At Alliance High School, students withdraw pocket money through one of the two clerks. On average, one clerk takes 3 minutes while the other takes 5 minutes to serve a student at the same time. Find the shortest time it takes to serve 200 students. (3mks)

2. Alice bought 144 oranges at sh. 100 for every six oranges. She sold some of them at sh. 72 for every three and the rest at sh. 60 for every two. If she made a 65% profit, calculate the number of oranges sold at sh. 72 for every three.(3mks)

3. Kylo has 26 coins whose total value is sh. 205. There are thrice as many sh. 10 coins as there are sh. 20 coins. The rest are 50 cents coins. Find the number of sh. 20 coins he has. (3mks)

7. ABCD is a square of length 7cm. ADB abd ABC are quadrants of circle centres A and B respectively. Find the area of the shaded region. (4mks)

8. Solve for x given the
$$27^{x+1} - 3^{3x+2} - 400 = 86$$ (3mks)

9. Find the capacity in litres of a bucket 24cm in diameter at the top and 16cm at the bottom and 20cm deep. (4mks)

13. Solve $3-5x > 2x+17 \geq 3$ and hence represent the solution in a number line. (3mks)

14. Given that the positional vectors of points PQ and R are **p, q** and **r** respectively, and that R is the midpoint of PQ,

    (i)   Write down a vector equation that relates **p,q** and **r.**

        (1mk)

    (ii)   If **p**= $\binom{5}{8}$ and **q** = $\binom{7}{4}$, find r and hence the coordinates of R.(3mks)

15. A salesman gets a commission of 2% on sales upto sh. 200,000. He gets an additional commission of 3% on sales above this. Calculate the commission he gets on sales worth sh. 500,000.   (3mks)

16. The sum of digits of a 3 digit number is 12. The ones digit equal to the sum of the other two and the tens digit is two less than the ones digit. Find the number.

    (3mks)

SECTION B: ANSWER ANY FIVE QUESTIONS ONLY(50MARKS)

(50MKS)

17.Draw the quadrilateral with vertices at A(-6, -1) B(-6, -4), C(3,2) and D(3. -1).

(a) On the same grid draw the image of ABCD under enlargement center (0, -1)
scale factor 1/3. Label the image A' B' C' D'   (3mks)

(b) Draw A" B" C" D" , the image of A' B' C' D' under a rotation of +90 about
(1,0)   (2mks)

(c) Draw A''' B''' C'' ' D''', the image of A" B" C" D" under reflection in the line
y-x=o.   (2mks)

(d) Draw A^{IV} B^{IV} C^{IV} D^{IV}, the image of A" ' B" ' C" ' D" ' under translation $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$
and write the

coordinates of the final image.   (3mks)

18. Atieno started a business with a capital of sh. 12000. Jane joined her after 4 months with a capital of sh. 10,000. Awinja joined them after 10 months with a capital of sh. 8000. If they made a profit of sh. 16,500 at the end of 15 months, find the share of each partner if they shared all the profit in the ratio of their capital and time in business. (6mks)

(b) A school requires to transport 800 bags of cement from Nairobi to Mombasa, 500 km away. The school can opt to use a container freight charges of 3000 for every 25km or pay sh, 50 per bag using a lorry. Find which option is cheaper and by how much. (4mks)

19. The figure below shows solid frustum with rectangular base measuring 18cm by 24cm and the top measuring 6cm by 8cm. The slant edges are each 26cm long.

Determine (i) the height of the original pyramid. (4mks)

(ii) volume of the frustum. (3mks)

(iii) Density in g/cm^3 if the solid has a mass of 7.488kg. (3mks)

20. A rectangular floor measuring 15m by 18m is to be carpeted using slabs of thickness 8cm.

(a) Calculate the volume of the material required to carpet the whole floor if there is no wastage. (2mks)

(b) In order to make a slab, sand, cement and gravel are mixed in the ratio of 3:2:1. Determine the volume of each material needed for the floor. (3mks)

(c) If each slab is a square, and only the biggest possible whole squares are used, determine the area of each slab and number of slabs required to cover the total area. (3mks)

(d) The total cost of laying a slab is sh. 120, find the amount of money the owner used to cover his floor. (2mks)

21 Victor works in Kisumu. He drives from Home to town in his car at an average speed of 80km/hr then completes his journey on foot at an average speed of 4km/h. The whole journey takes him 48 minutes. One day his car broke down on the way. He had to walk 5 times as far, arriving in his office 1 hour, 8 minutes 24 sec later. What is the distance between his home and place of work.(10mks)

Hint: Let x be the distance from home to town and y the distance from town to work.

22Using a ruler and a pair of compass, do the following constructions.

(a) Triangle PQR such that <QRP = 60^0, PR=4cm, <QPR=75^0. Measure QR and QP. (4mks)

(b) Draw a circle center 0 that touches the vertices of the triangle PQR. Measure the radius. (4mks)

(c) Drop a perpendicular from P to the line QR and measure it. (2mks)

23The following is a frequency distribution of marks obtained by candidates in an examination.

Marks	number of candidates
1 – 10	4
11- 20	8
21 – 30	10
31-40	13
41-50	19
51-60	22
61-70	18
71-80	12
81-90	6

(i)   State the modal class.   (1mk)

(ii)   Calculate (i) the mean   (3mks)

               (ii) the median.   (3mks)

(iii)   Draw a histogram to represent the information.   (3mks)

24An employee earns a basic salary of ksh. P and is entitled to a house allowance of ksh. 10480 per month. The employee is entitled to a personal relief of sh. 1162. He found that the employer deducts ksh. 6075.75 as PAYE each month.

The table below shows income tax rate

Monthly tax pay	rate of tax in each shilling
1 – 10165	10%
10166 – 19740	15%
19741 – 29316	20%
29317 – 38892	25%
Over 38892	30%

(i)   Calculate his monthly gross income.   (8mks)

(ii)   Calculate his basic monthly salary.   (2mks)