MATHEMATICS
P456/1

BUGIRI DISTRICT SECONDARY SCHOOOLS EXAMINATIONS
BOARD
UGANDA CERTIFICATE OF EDUCATION
2013
MATHEMATICS PAPER 1
TIME: 2 ½ HOURS

SECTION A (40 MARKS)

1. Given that $3+5_{eight} = 245_{ten}$. Find the value of n
2. The coordinates of points A(5,4) and (¯3,b), find the possible values of b such that $|AB| = \sqrt{65}$

3. Given that $\begin{pmatrix} 3 & a \\ b & -12 \end{pmatrix} \begin{pmatrix} 7 \\ -6 \end{pmatrix} = \begin{pmatrix} -3 \\ 51 \end{pmatrix}$ find the values of a and b

4. Solve for x in $\dfrac{x-10}{6} = \dfrac{x-3}{2}$

5. With out using tables or calculator, simplify
$$\frac{\text{Log }_{10}{}^{125} - \log_{10}{}^{25}}{\log_{10}{}^{25} + \log_{10}{}^{5}}$$

6. The matrix $\begin{pmatrix} 7 & 7 \\ 1 & 2n-1 \end{pmatrix}$ is a singular matrix, determine the possible values of n.

7. A parallelogram has sides of length 6cm and 4cm, and an angle of $150°$. calculate the area of the parallelogram

8. Given that $T = 2\sqrt{{}^{1}/_{g}}$ make g the subject of the formula.

9. The mean mark of eight boys is 35. When two boys of the same mark join the group, the new mean becomes 36. What is the score of each of the two boys?

10. Using a ruler, a pencil and a pair of compasses <u>only</u> Construct an angle of $75°$

<u>SECTION B</u>
<u>Answer any five questions.</u>

11. a) Using a pair of compasses, ruler and a pencil only, construct a triangle ABC, in AB=7cm, BC=8.5cm and angle ABC is $120°$.
    b) Measure AC.
    c) Construct an inscribed circle to the triangle.
    d) Measure its radius.

12. a) An object of area $10.5cm^2$ is mapped on to its image of area $105cm^2$ by matrix transformation given by $\begin{pmatrix} I & -I \\ m & 4 \end{pmatrix}$ determine the value of m.

    b) Given that $p = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$ and $q = \begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix}$
       Find (i) pq   (ii) $(pq)^{-1}$

13. a) A fair die is rolled once with a coin if one side of the coin has a fish and the court of arms ,
    i.   Construct a possibility table for the outcome.
    ii.   Find the probability that an even number and fish will show up

c) Use matrices to solve the simultaneous equations

$x + 2y = {}^-5$ and $3x - y = 13$

14. a) From top of 0 of a cliff, 100m high, the angle of depression of a ship P is $20.3°$. how far is the ship from the point F at sea level vertically below O?

b) Given that $\sin \theta = {}^4/_5$ and is obtuse, find the value of $\sin \theta + \cos \theta$.

15. The heights of 50 students were measured and recorded as below

5.4 4.7 7.0 6.1 3.4 5.2 3.2 4.5 5.9 6.8
6.7 5.8 8.5 6.5 8.2 5.4 4.2 6.5 4.1 7.5
7.1 5.2 5.4. 6.9 5.7 8.1 6.4 6.1 7.2 6.2
3.7 5.1 5.6 5.0 7.0 7.9 5.4 7.1 3.5 7.2
8.3 6.5 5.7 6.0 5.1 6.7 5.3 4.6 6.9 6.7

a) Construct a frequency distribution table with class intervals of equal class width starting with $3.0 - 3.9, 4.0 - 4.9$

b) State the modal class.

c) Calculate the mean.

d) Draw a histogram and use it to find the mode

16. a) Use logarithims tables to find the value of

$$\sqrt{\frac{12 \times 13.1}{13.1}}$$

b) Given that y is directly proportional to x, and x=16 when $y = 64$, find x when $y = 20$

17. a) By shading the un wanted region, draw a graph to show the region representing
$y < 4x$, $y > {}^1/_2$ and $x + y < 6$

b) List down the five lattice points in the region

END