MID –TERM ONE EXAMINATION 2018

S.2 MATHEMATICS TIME (2hours and 30mintes)

Instructions:

-***Attempt all questions.***

-All working should be properly displayed.

-Simplify your answer as far as possible.

SECTION A (40 MARKS).

1. Given that $\boldsymbol{a * b = a^2 + \sqrt{ab}}$

Find the value of (i) $\boldsymbol{(1 * 4)}$

(ii) $\boldsymbol{(1 * 4) * 3}$

2. given that **XYZ** $_{SIX}$ = **143** $_{eight.}$ Find the values of **x, y** and **z**.

3. In class of 60 students, 27 passed physics and 35 passed chemistry. If two students failed both subject, determine the number of the students who;

(i) Passed both subjects.

(ii) Passed only one subject.

4. without using mathematical tables or calculators,

Simplify; $\boldsymbol{\log_{10} 1200 + \frac{1}{3}\log_{10} 27 - 2\log_{10} 6.}$

5. Male x the subject in the formula; **y =** $\frac{3x-5}{4-x}$. Hence find the value of x for which y=1.5

6. Given that two points A and B lie on a straight line and that the coordinates of A and B are (-2, 5) and (0,-3). Determine;

(i) The mid-point of the line **AB**

(ii) The equation of the line **AB**

7. Molly bought 2Kgs of rice and 3Kgs of sugar at 3150/= and bought 2Kgs of sugar and 3Kgs of rice at 2850/= Determine the cost of;

(i) a kilogram of rice

(ii) A kilogram of sugar.

8. Find the **L.C.M** and the **H.C.F**. of 24, 30, and 36.

9. Given that y varies inversely as $\mathbf{x^2}$ and **y = 4** when **x = 3**. Find the value of **X** when **y = 6.**

10) A trader bought a dozen of pencils at **shs. 1000** and the sold them at a profit of **44%**. Calculate the;

(i) Profit made by the trader.

(ii) Amount the customer paid for each pencil.

SECTION B (60 MARKS)

11) Using a pair of compasses, ruler and pencil only;

a) Construct a triangle **PQR** with **PQ** = 4cm, angle **PQR** = 105^0 and angle **QPR** = 45^0

b) Construct a perpendicular from R to the line **PQ** and produce this line to meet **PQ** at **M.**

c) Circumscribe triangle **PQR** and measure its radius.

12 a) Edward invest **Shs. 125000** at **18%** per annum. What is his annual interest?

b) In 2010 the price of beans increased from **1300/=** to **1500/=** per Kg. Find the percentage increase in the price.

c) If the price increase persisted at the same rate, what would be the price in 2011?

13 a) Given that a = -2, b = 4, c = 5. Find the value of $\frac{ab^2-ab}{2}$

b) Express **2.069069** ……..in the form $\frac{x}{y}$ in its simplest form.

c) Solve for x in the equation $\frac{2x}{5} - \frac{1}{2} = \frac{2x+3}{4} - \frac{3(x+1)}{5}$.

14. Given that the equation of the line is represented by **y = 3x+5**. For

X	-3	-2	-1	0	1	2
3x			-3			
5			5			
Y	-4			5	8	

b) Plot a graph representing the line **y = 3X + 5** from the table above.

c) Determine the Y intercept of the graph drawn.

15 a) without using tables or calculators, simply $\frac{\sqrt{5}}{\sqrt{3}+\sqrt{5}}$

b) Prime **factorize** and find the square root of the following

(i) $1\frac{11}{25}$

(ii) **5184**

End

GERSHIBORN CHRISTIAN HIGH SCHOOL MID TERM EXAMS 2018

Uganda Certificate of Education

MATHEMATICS

Paper 2

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

*Answer **all** questions in section A and any **five** questions in section B .*

*Any additional questions answer will **not** be marked.*

*All necessary calculations **must** be shown clearly with the rest of the answers.*

Therefore, no paper should be given for rough work.

Silent non programmable scientific calculators may be used.

Mathematical tables, squared papers are provided.

*State the degree of accuracy at the end of each answer attempted using a calculator or tables; and indicates **Cal** for calculator, **Tab** for mathematical table*

1. Simplify. $\left(\frac{512}{729}\right)^{\frac{-2}{3}}$ (04marks)

2. In an examination; 56% of the candidates failed English, 48% failed science. If 18% failed both English and science, find the percentage of those who passed both subjects.(04 marks)

3 The lowest common multiple (**LCM**) of two numbers is 144, if one of the numbers is 72 and their highest common factor (**HCF**) is 24, find the other number (04 marks)

4 Given $\boldsymbol{a} = \begin{pmatrix} -3 \\ 2 \end{pmatrix}$, $\boldsymbol{b} = \begin{pmatrix} 4 \\ -6 \end{pmatrix}$ and $\boldsymbol{c} = \begin{pmatrix} 5 \\ -10 \end{pmatrix}$ and p = 2**a** - $\frac{1}{2}$**b** = $\frac{2}{5}$**c**. Find the magnitude of p. Correct your answer to 2 decimal places. (04 marks)

5 Solve; $\log_{10}(3x + 4) + \log_{10}(3 - x) = 1$ (04 marks)

6 By selling a transistor at shs. 126000. James gains 50%' at what price should he sell the transistor to gain 10%? (04 marks)

7 Two containers have **base area** 750cm^2 and 120cm^2 respectively.

Calculate the **volume** of the larger container in liters given that the **volume** of the smaller container is 400cm^3. (04 marks)

8 The **x- intercept** that a certain straight; line makes is 3 and the **y – intercept** is -2. Find the equation of the line. (04 marks)

9 The function $f(x) = ax^2 + 4x$. If $f(-3) = 78$, find the value of a. (04 marks)

10. A girl is looking at a bird on top of a tree. The girl is 1.4 meters tall, and the angle of elevation of a bird from the girl is 28^0.How high is the tree if the girl is 30 meters from the tree. (04 marks)

SECTION B ;(60 MARKS)

Given that $f(x) = 3(2^x)$. Evaluate;

(i) $f(3)$

(ii) $f(0)$

(iii) $f(4)$

(b) Given that $h(x) = \sqrt{(x+2)}$ and $g(x) = \log_{10}(1 + x^2)$. Find;

(i) $gh(x)$ (06 marks)

(ii) $gh(97)$ (06 marks)

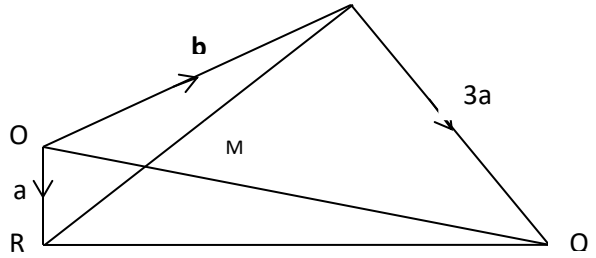
12 (a) Find the LCM of $3a^2b^2c$ and $6ab^2c^3$. (04 marks)

(b) On a certain map an estate is represented by an area of 49cm^2. If the actual area of the estate is 1200 hectares, find the scale of the map in the form 1 : n. (1 hectare = 10^8cm^2). (04 marks).

(c) Use tables to calculate, **3.754** $\times \sqrt{\frac{28.73}{125.3}}$ correct to three significant figures.(04 marks)

13. (a) Given that **p** = $\binom{5}{-8}$ and **q** = $\binom{7}{4}$, find r ans hence state the coordinates of position vector **R** if **r** = 0.5p + 0.5q. (04 marks)

(b) the figure be;pw shows a trapezium in which OR is parallel to PQ. M is a point on OQ such that OM : MR = 1:3 and PQ = 3OR



(I) Given that OR = a and OP = b; express RQ and OR in terms of a and b.(04 marks)

(II) Show that the points P, M, R, are collinear. (04 marks)

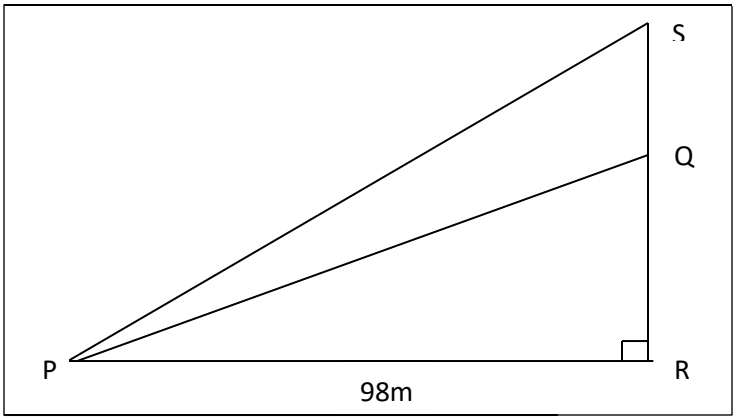
14. Quantity P partly varies as the square of x and partly as x. When x = 3, p = 48 and when x = 5, p = 110.

(a) Form an equation relating p and x. (08 marks)

(b) Determine the value of p when x = 6. (04 marks)

15. Draw the graph $y = 2x^2 + 3x - 10$ for values of x: $-4 \leq x \leq 4$. Use your graph to solve the equation $2x^2 + 3x - 15$(please show all your working)

16. a) the diagram represents two angles of the elavattion from a point P on a piece of horizontal ground PR. The point Q represents the height RQ of a tower, and S represents the height SQ of a tank on top of a tower. The angle of elevation from P to Q is 38^0, while the additional angle of elevation from P to S is 5^0



If **PR** is 98m, calculate the height of the tank on the top of the tower. (06 marks)

(b) A woman wants to work out the height of the flag pole whisch is on a small island in a lake. From a point on the ground she measures the angle of eleavation of the top of the flagpole and finds its 48^0. She then walks in a straight line towards a flag pole for 20m and finds that the angle of elevation is 56^0. The woman is 1.5m tall. How tall is the flag. (06 marks)

End