456/2
MATHEMATICS
Paper 2
AUGUST, 2019
2 hours

JINJA JOINT EXAMINATIONS BOARD

Uganda Certificate of Education

MOCK EXAMINATIONS - AUGUST, 2019
MATHEMATICS

Paper 2

2 hours 30 minutes

I ^{N} STRU CTIONS TO CANDIDATES:

Answer ALL questions m Section A and not more than FIVE.from section B.

Any additional question(s) answered will not be marked.
All necessary calculations must be shown and should be done on the same page as the rest ofthe answer.

Mathematical tables and graph papers are provided.

Silent, non-programmable scientific calculators may be used.

SECTION A (40 MARKS) Attempt all questions.

1. The gradient of a line passing through points K (-4, 16) and L (12,2t) IS "i . I Ind the value of t. 104 Marksl

2. Given that $p(x) = \log_3 X$ and $q(x) = 9^x$ find pq(6)   104 Marksl

3. In a school of 270 students, 1 10 are girls and 210 students stay at school for lunch. If 50 of the girls go home, how many of the boys do not stay at school for lunch0 [04 Marks)

4. Mweneklra High school is located on a stretch of land of area 45 km 2.0n a Inap, Its area ts7.2cm ^{2}.Determtne the scale of the map.   104 Marks)

5. Given that; $T = R +$,express P in terms T and R hence evaluate P if T —6 and

    104 Marks)

6. The points A and B are position vectors, OA   and 0B   M IS a point on AB such

    that AM AB   .Fmd the vector 0M.   104Marksl

7. Akiteng's net income per month is 417,000 =. She is entitled to an allowance of

    45,000 —per month and she pays a tax of 23,000 Calculate her

    (i) Gross monthly income

    (li) Taxable Income   104 Marks)

8. A motorist travels 100km at 40km/hr then 40km in I hour 40minutes.Calculate the average speed for the whole Journey. 104 Marks)

9. A pyramid on a rectangular base measures 5cm by 4cm, the vertical height ISI 2cm . Draw the pyramid and find the angle between the opposite faces With base 5cm. 104 Marks)

1(). From the height h metres above sea level, it is possible to see a distance of approximately d kilometres, where d and h are connected by the formulae 3d2 = 37 h. What distance can be seen from a height of 20m? (Give your answer to 2 significant figures). [04Marksl

SECTION B [60 MARKS)

Answer only five questions in this section

11. (a) Given that f (x) = 2x + 8 and fg(x) = x — 3. Find:

      (i) g(x)hence g(15)

      (ii) g -l (x)
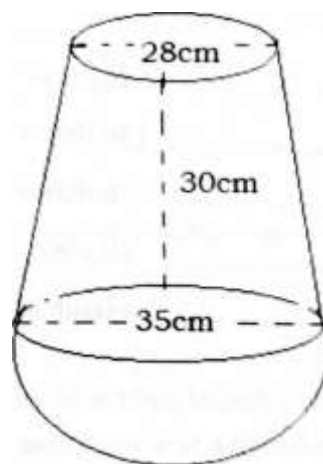
      (iii) gf(x)   [08Marksl

 (b)Find the value of x when .

   (i f (x) = g(x)

    (ii) —IS meaningless.   104 Marksl

12. The figure below shows two solids a frustrum from a cone and a hemisphere joined together. The diametres of the top and bottom of a frustrum are 28cm and 35 cm respectively. The frustrum is 30cm high. As shown below.

    Calculate;(a) The original height of the cone   103 Marksl

    (b)Volume of the solid   109**Marks|**

13. (a) Solve for y If $81^{y} : y\ 7 = 6$ 104.Marksl

Iarks|

(b) The fare (F) for a person in Iganga Bus gomg to Kampala IS partly constant and partly vanes as the square root of the passengers (n) in the bus. If the tare ot 12,300 = is pard '"hen there are 100 passengers and - when there are 144 passengers. Find how much IS paid hen the bus takes Sl passengers. 108 **N**

14. The tax structure In a certain country on taxable Income IS as follows:

Taxable Income (shs)per month	Tax Rates ($^{0}0$)
120,001 - 280,000	9.5
280,001 - 480,000	12.5
480,001 - 880,000	20
Above 880,000	28

Mr. Anguyo's gross monthly income is 850,000 He is entitled to the following allowances;

Transport. .... 40,000/ _per month

Medical . ... 120,000/_per annum

Insurance .. .. 150,000/_per annum

Housing..........................80,000/=per month

Family.............................a tenth of gross pay.

Calculate;

(a) His monthly taxable Income

(b) Tax paid annually

(c) His monthly net income to the nearest dollar if

IS(US dollar) =UGX.3650/= 112 Marksl

15. The Venn diagram below shows 250 types of vehicles being sold in 3 bonds in Uganda, namely in Nagayt, Osama and Cosmos bonds.
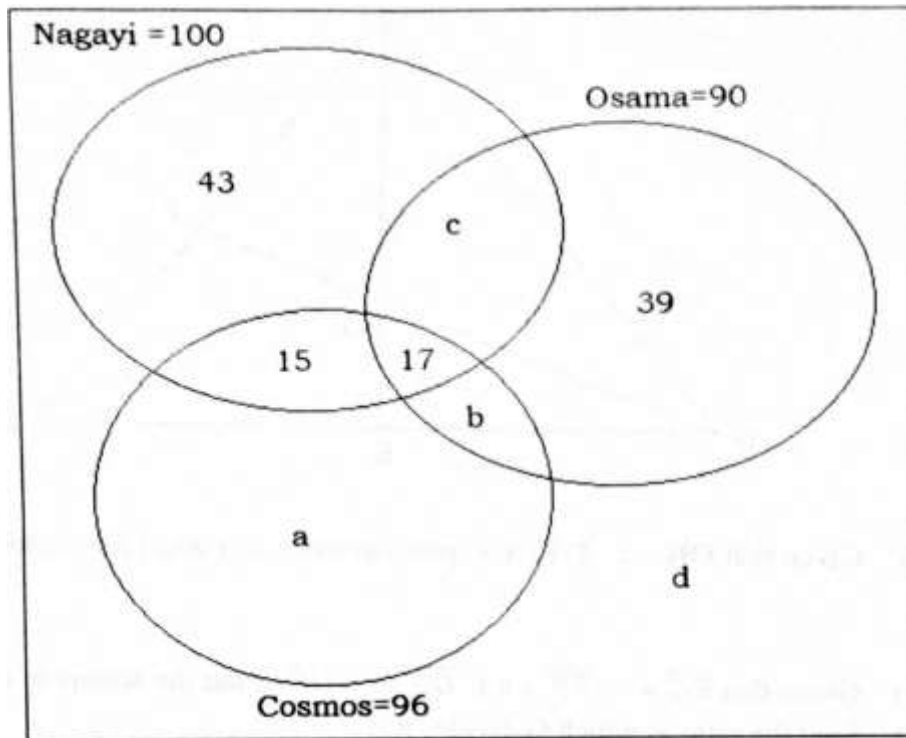
(a) Find the values of a, b, c and d.   [08 Marks)

(b) Find the number of vehicles sold in at most one bond. 102 Marks]

(c) If a vehicle is picked at random from the bond, find the probability that it is Nagayl and Osama but not Cosmos bond.   102 Marks)

16. Town A and B are 600km apart. At 9.30amMubaka wasl 20km away from town A moving towards Town B on a motor cycle at a speed of 80km/hour, when Byakuno set off from town A In a saloon car moving nonstop at 100km/hour towards town B. At 2.42pm Byakuno overtook Mubaka and they continued their journey. By using calculations without drawing the graph, determine; (i) The distance from A when Byakuno overtook Mubaka.

(u) The time when Mubaka set off from town A.

(iii) The time(s)when Byakuno and Mubaka arrived at Town B.

(iv) Difference in time(s) of amval of the two men.

17. In the figure, E is a midpoint of RT, F is on T such that OF: $= 3: 5$ and G is the point of intersection of lines OE and RT.
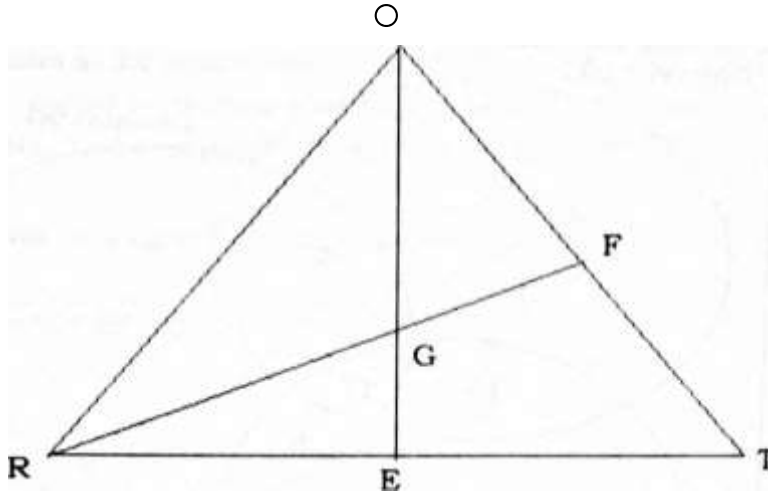
(a)   Given that OR — r , ()T— t, express in terms of r and t the vectors OE andRF
[04 Marks)

(b)   Given that RG $=$ m RF and OG $=$ n OE . Find the scalars m and n. [05Marksl
(c)   Find the ratio in which G divides RF.   (03 Marks)

End