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MATHEMATICS
Paper 2
July - August 2017
2 ½ hours

KAYUNGA SECONDARY SCHOOLS HEAD TEACHERS AND PRINCIPALS ASSOCIATION (KASSHPA)
JOINT MOCK 2017
MATHEMATICS
PAPER TWO
2 HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES

- Answer **all** questions in Section A and any **five** questions from section B
- Any additional question (s) answered will not be marked
- All necessary calculations must be done in the answer booklet provided. Therefore, no paper should be given for rough work
- Graph paper is provided
- Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used

SECTION A: (40 MARKS)

Answer **all** questions in this section

1. If g (x) = 4 – x^2 and h (x) = 2x + 1. Find;
   (i) hg(x)
   (ii) hg(4) (04 marks)

2. Use logarithm table to evaluate; $\frac{4.43 \ X \ 0.41}{0.013}$ (04 marks)

3. Given that position vectors **OP** = $\begin{pmatrix}4\\3\end{pmatrix}$ and **OQ** = $\begin{pmatrix}4\\-1\end{pmatrix}$. Find the magnitude of **PQ**. (04 marks)

4. The number of people who play football, (F) or basket ball (B) is twice the number of people who play F and B. If n (F) = 9 and n (B) = 6 how many play both games. (04 marks)

5. Find the equation of a line passing through the point (0,-5) and is perpendicular to the line y + 3x = 1. (04 marks)

6. Given that vector **OA** = $\begin{pmatrix}-2\\1\end{pmatrix}$ and **OB**= $\begin{pmatrix}7\\4\end{pmatrix}$, find the magnitude of vector
   P = **OA** + $\frac{2}{3}$ **AB**. (04 marks)

7. Six boys, three girls and father shared shs. 360,000 in the ratio of 4:5:3 respectively. Find how much each girl got. (04 marks)

8. Find the coordinates of the points of intersection of the curve. y = $5x^2$ - 13 and the line y =7. (04 marks)

9. Solve the equation: $\log_2$ (3x -5) - 1 = $\log_2$ x. (04 marks)

10. On a map whose scale is 1:50000, a swimming pool is represented by an area of 8cm^2. Calculate the actual area of the swimming pool. (04 marks)

SECTIOB B: (60 MARKS)

Answer any **five** questions from this section

All questions carry equal marks

11. (a) Given that h(x) = $\frac{4+8x}{x^2-4} + \frac{2}{x+2}$ by first expressing h (x) in the form $\frac{nx}{x^2+m}$ find,

(i) the values of x for which h(x) is undefined

(ii) h (4) (07 marks)

(b) Given that f(x) =x^2 - 7 and g(x) = x +1, find fg(x) and simplify the expression. (05 marks)

12. Districts P and R are 500km a part. A bus left P and traveled towards R at an average speed of 60km/hr. After 2 ½ hrs, a car left P and travelled along the same road at an average speed of 100km/hr

(a) Find the;

(i) distance of the bus from R when the car took off

(ii) distance the car traveled to catch up with the bus.

(b) Immediately as the car caught up with the bus, the car stopped for 25 minutes. Find the new average speed at which the car travelled in order to reach R at the same time as the bus. (12 marks)

13. In a workshop, 30 guests speak Arabic (A), 25 Speaks German (G), 10 speak French (F) and Arabic (A), 4 speak French and German only. The number of guests who speak French and Arabic only are two more than those speaking neither language. If n (AnGnF) = 3, n(AnGnF') = n(A'nG'nF') = x and the probability that a guest speaks at least two languages is $^1/_3$, use a Venn diagram to find;

(i) The value of x

(ii) How many guest speak only one language

(iii) n(ε) where ε is the universal set.

(iv) The percentage of guest speaking German only. (12 marks)

14. Ojok's gross monthly salary is shs. 1,200,000, with the following allowances:

Medical shs 600,000 per annum

Marriage one fifth of the gross monthly income

Unmarried shs. 200,000 per month

Family allowance for one child at the following rates;

A child below 10yerars shs 150,000

A child above 10 years shs. 100,000

Ojok is married with two sons; One aged 7 years and other 12 years.

The monthly income tax is calculates as follows.

Taxable income (shs)	**Tax rate (%)**
01 300,000	20
300,001 500,000	25
500,001 900,000	30
900,001 and above	40

Calculate Ojok's monthly;

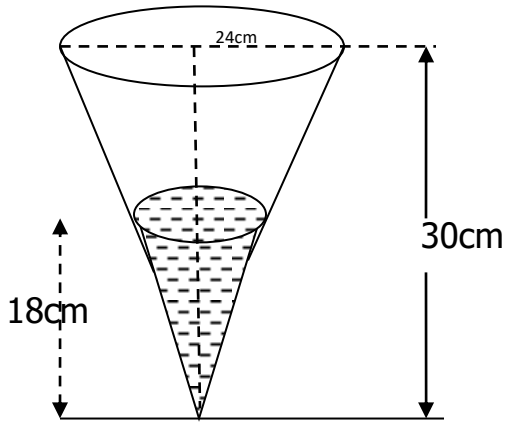
(i) Taxable income
(ii) Income tax
(iii) Net income (12 marks)

15. A quantity M is partly constant and partly varies as N^2, when N=2, M=40. When N=3, M=65.

a) Form an equation relating M and N.

b) Determine the values of N when M = 100. (12 marks)

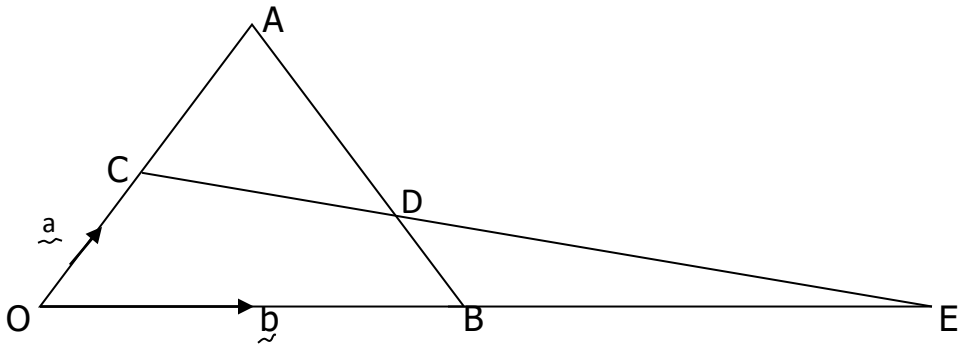
16. The diagram below show a right cone shaped flask of base radius 24cm and depth of 30cm contain water at a depth of 18cm.



Calculate;

(i) the radius of the surface of the water.
(ii) Volume of the water
(iii) Volume of the whole cone (12 marks)

17. In the diagram below, **OA** = **a**, **OB** = **b**, **OC** = **CA, OB** = **BE** and **BD**: **BA** = 1: 3.



a) Express in terms of **a** and **b**

i) **BA** ii) **BD** iii) **CD** iv) **CE**

b) Find the ratio of **CD**: **DE** (12 marks)

END