MANGU HIGH SCHOOL

121/1
MATHEMATICS
PAPER 1
MOCK - JULY 2018
TIME: 2½ HOURS

NAME:____ADM.NO______________

INDEX NO.________________________ CLASS: ___________

Kenya Certificate of Secondary Education

MOCK EXAMINATIONS

Mathematics
Paper 1
2½ Hours.

Instructions to Candidates

(i) Write your **Name, Adm. No., Class** and **Index No.** in the spaces provided above.
(ii) This paper contains **TWO** sections: section I and section II.
(iii) Answer **ALL** the questions in section I. In section II choose **FIVE** questions only.
(iv) Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.
(v) Marks may be given for correct working even if the answer is wrong.
(vi) Negligent and slovenly work will be penalized.
(vii) Non programmable silent electronic calculators and KNEC mathematical tables may be used, except where stated otherwise.

For Examiner's Use only

Section I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total

Section II

17	18	19	20	21	22	23	24	Total

GRAND TOTAL =

This paper consists of **15 printed pages.** Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

Turn Over

SECTION I: (50 MARKS)

Answer all questions in this section in the spaces provided

1. Use logarithm tables to evaluate (3mks)

$$\frac{\sqrt[3]{7 \log 8.392}}{10.3 \sin 69.4}$$

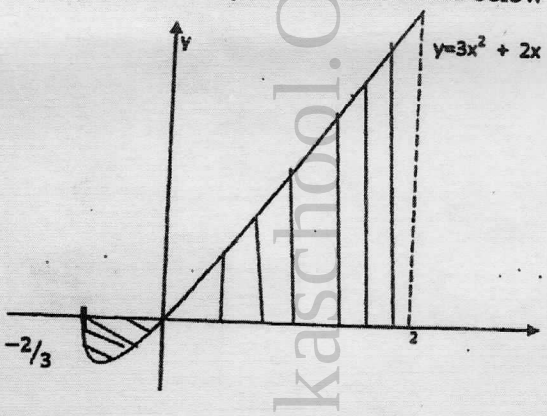
2. Simplify (3mks)

$$\frac{X^2 + x - 4xy - 4y}{4yx - x^2y + 4y^2 - xy}$$

3. Evaluate

a) $\int^{2}_{-2/3} (3x^2 + 2x)\, dx$ (2mks)

b) Use the integration above, to find the area shaded below (2mks)

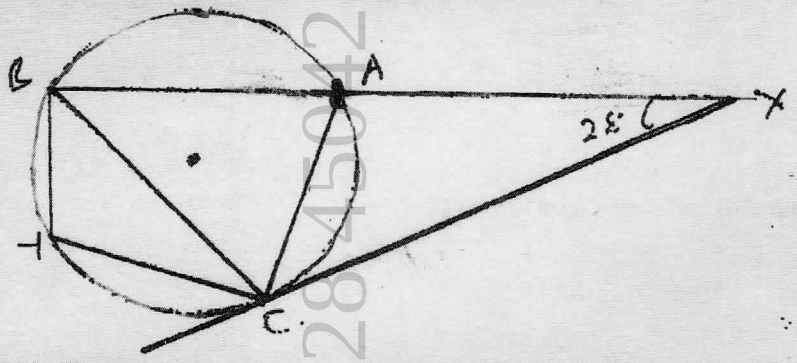


4. Use the tables of reciprocal, cube root and square root to evaluate (3mks)

$$\frac{0.40}{\sqrt[3]{24.56}} + \sqrt[3]{0.346}$$

5. The sum of three digits in a three digits number is nine. The tens digits is half the sum of the other two and the hundred digits is half the units digit. Find the total value of the number (3mks)

6. In the diagram that follows, xc is a tangent to the circle ABYC at c. Y is the midpoint of arc BC. If angle BXC = 28^0 and angle BCA = 2 angle ACX. Find (3mks)



i) Angle CBA

ii) Angle CBY

iii) Angle BYC

7. The straight line whose equation $5x - 7y + 35 = 0$, pass through P, Q and R. If point is on the X –axis, point P on the Y-axis is such that PR = RQ, find the equation of line AR in double intercept form given that point A(3, -3) (3mks)

8. Evaluate (3mks)

$$\frac{-19 + (6 - 8) \div 2 \times 5}{16 \div 4 \times -3} \div \frac{-24 \div (-3) \times 4 - (-20)}{-6 \times 12 \div 3 + (-2)}$$

9. A point A (-2, 1) is reflected to A'(x, y) with $y + x + 3 = 0$ as the mirror line. The line $y + x + 3 = 0$ intersects the line connecting A to A' at point B. Find the coordinates of B (3mks)

10. The table below represents marks scored by 80 Form IV students in mathematics.

Marks	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 -79	80 -89	90 – 99
Frequency	2	3	9	12	40	10	3	1

On the same Cartesian plane;

a) Draw a histogram and a frequency polygon to represent the data (3mks)

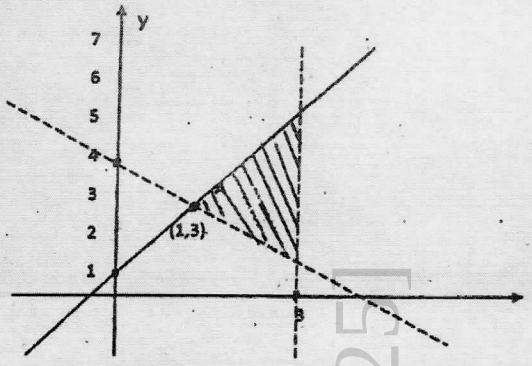
b) Estimate the median and show it on the graph (1mk)

11. A chemist had $60cm^3$ of solution containing 25% of water. If Ycm^3 of the solution is poured away and replaced with the same amount of water, the resulting solution is 50% of water. Determine the value of Y (3mks)

12. If it's given that U=4a + 3b, V=5a – b, W=3u-2v and W = ha + (h-k)b, where h and k are constants, find the value of h and k (3mks)

13. The surface are of two similar bottles are $12cm^3$ and $108cm^2$ respectively. If the larger one has a volume of $810cm^3$. Find the sum of their volumes (3mks)

14. Write down the three inequalities which defines the shaded area labeled A in the figure below (3mks)



15. The sum of the triangles formed by polygons of sides n, n-2 and n-8 are 47. Find he sum of the interior angles of the polygon which has fewest number of sides (3mks)

16. A metal P is an alloy of two metals Q and R. Metal Q has a mass of 70g and a density of $16g/cm^3$. Metal R has a mass of 19g and a density of $4g/cm^3$. Find the density of the alloy (3mks)

SECTION II: 50 MARKS

Answer FIVE questions only in this section in the space provided

17. a) In a certain year, the price of a wall unit was sh. 12,000. If the number of units sold are 50 times less than the cost of each, find the total amount collected from the sales (2mks)

b) The second year the price per unit increased by 25% while the number of units sold decreased by 10%, calculate the percentage increase in the amount received from the sales (4mks)

c) During the third year, the price of the units changed in ratio 16:15. If the number of units sold was p% less than the first year, calculate the value of p, given that the amount received from sales in the second that third year were equal. (4mks)

18. A lorry left town A for town B at 6.50pm at an average speed of 60kh/h. After 1 hr 45minutes a car left town A for B at an average speed of 90km/h. If A is 317km from B, determine

a) The distance of the lorry from town B when the car took off (3mks)

b) The distance the car travelled to catch up with the lorry (4mks)

c) What time of the day did the car catch up with the lorry? (3mks)

19. Three towns P, Q and R are such that Q is 150km from P on a bearing of 053. The bearing of R from P is 133^0 and the bearing of R from Q is 160^0. Without using scale drawing, find the

i) Distance of R from P (4mks)

ii) Q from R (3mks)

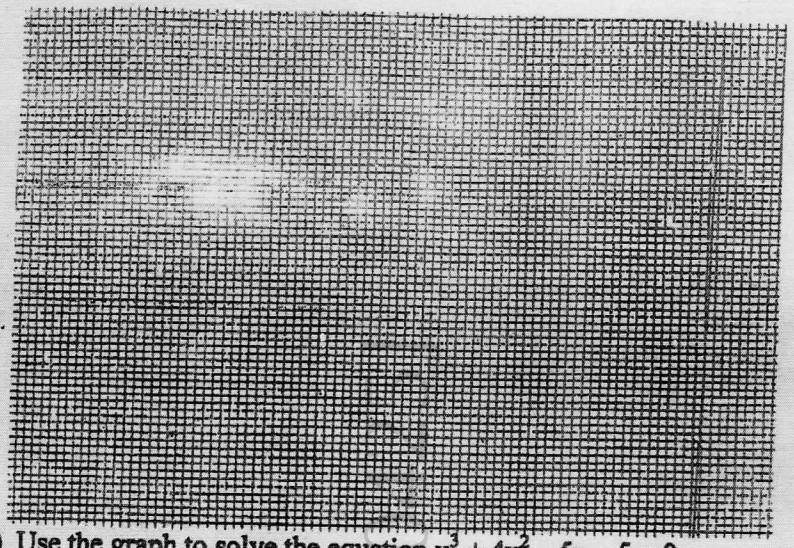
iii) Bearing of P from R (1mk)

iv) The time to the nearest minute taken by a bus travelling at 80km/h to travel from P to Q and back to P (2mks)

20. a) Copy and complete the table below for $y = x^3 + 4x^2 - 5x - 5$

X	-5	-4	-3	-2	-1	0	1	2
Y			19			-5		

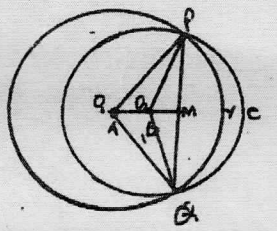
b) On the grid provided draw the graph of $y = x^3 + 4x^2 - 5x - 5$ for $-5 \leq x \leq 2$ (3mks)



c) i) Use the graph to solve the equation $x^3 + 4x^2 - 5x - 5 = 0$ (2mks)

ii) By drawing suitable straight line on the same axes, solve the equation $X^3 + 4x^2 - x - 4 = 0$ (3mks)

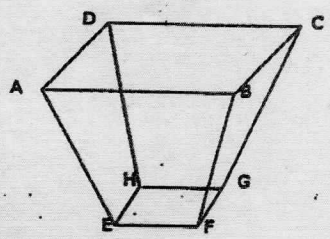
21. In the figure below two circles centre A and B intersect as shown. If PQ is the common chord such that the two centres lie on the same side of PQ and that Pa=8cm, PB=6cm, and PQ=4cm, find the



a) Area of the minor segment (4mks)

b) The area of common region between the two circles (6mks)

22. The figure ABCDEFGH below represents a model litter box formed by removing the bottom part of an inverted rectangular based pyramid AB = 15, BC = 10.5, EF = 5cm. The perpendicular height of the model is 4cm



Calculate

a) The perpendicular height of the model pyramid (2mks)

b) Volume of the model (3mks)

c) The outer surface area of the model if the small rectangular base is covered (5mks)

23. A hall can accommodate 600 chairs arranged in rows. Each row has the same number of chairs. The chairs are arranged such that the number of rows increased by 5 but the number of chairs per row decreased by 6

a) Find the original number of rows in the hall (6mks)

b) After the rearrangement 450 people were seated in the hall leaving the same number of empty chairs in each row. Calculate the chairs per row that are not occupied (4mks)

24. Points P (3, 2) and Q (-8, 6) map onto P′ (5, 4) and Q′ (-28, 16) respectively under an enlargement. Determine calculation the;

i) Centre of enlargement (4mks)

ii) Scale factor (2mks)

iii) In the grid provided draw triangle ABC such A (5, 1), B (1, 2) and C (3, 5). Determine by drawing the coordinates of A′B′C′ under and enlargement scale factor -2 and centre (0, 0) (4mks)

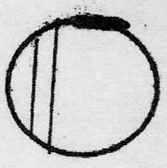
SECTION A

Answer all the questions in this section

1. a) Give two differences between solar radiation and terrestrial radiation during heat transfer in the atmosphere. (2 mks)

   b) i) What is the meaning of the following symbols as used in cloud cover description in diagrams X and Y. (2 mks)

X



Y

X...

Y...

   ii) State two characteristics of cumulo-nimbus clouds (2 mks)

2. a) State three causes of earth movements (3 mks)

   b) Name two main earthquake zones in the world. (2 mks)

3. a) Give two reasons why sedimentary rocks are widespread in the coastal plains of Kenya. (2 mks)

   b) State three ways in which volcanicity has influenced human activities in Kenya. (3 mks)

4. a) What is biological weathering? (1 mk)

   b) Describe how block disintegration occur in parent rocks (3 mks)

5. a) Name two features found on emerged high land coast. (2 mks)

   b) State three conditions necessary for the formation of a spit. (3 mks)

SECTION B

Answer question 6 and any other two questions from this section

6. Study the map of Oyugis 1:50,000 (sheet 130/1) provided and answer the following questions.

   a) i) Give the six figure grid reference for the school at Nyamuga on the southwestern part of the area covered by the map. (1 mk)

   ii) Name two districts covered by the map of Oyugis (2 mks)

   iii) Name two hydrographic features in the area covered by the map. (2 mks)

   iv) What is the bearing of the school at Okuta from the school at Nyamuga? (2 mks)

   b) i) Give the height of a hill at grid square 6743. (2 mks)

   ii) State the dates for the construction of the map of Oyugis. (2 mks)

   c) i) Draw a rectangle measuring 12cm by 16cm to represent the area enclosed by Eastings 71 and 74 and Northings 21 and 25.

   On the rectangle sketch and label the following features

   - Forest (1 mk)

- River Riana (1 mk)
- All weather road loose surface (1 mk)

ii) Calculate the scale of the new map drawn (c) (i) above (2 mks)

d) i) Citing evidence from the area covered by the map of Oyugis, explain two factors that have favoured the practice of brick making. (4 mks)

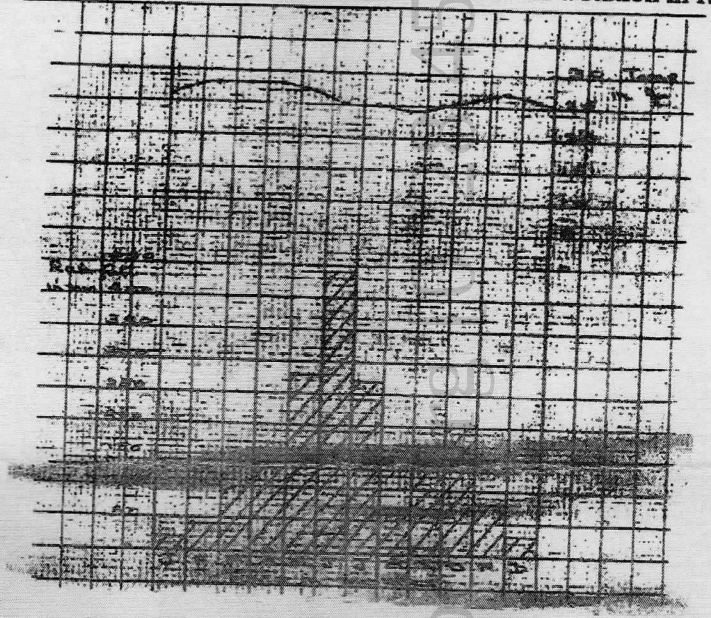
ii) Describe the distribution of relief features in the area covered by the map of Oyugis. (4 mks)

7. a) i) Differentiate between weather and climate (2 mks)

ii) Explain how the following factors influence climate

- Warm ocean currents (4 mks)
- Latitude (4 mks)

b) The graph below represents the climate for a station in Kenya.



Describe the characteristics of climate represented by the graph. (5 mks)

c) Explain how tropical savanna vegetation is adapted to the climatic condition (6 mks)

d) Form four Geography students in your school are planning to carry out a field study on forest vegetation around the school

i) Give two objectives for their study (2 mks)

ii) Give two follow up activities they would be involved in. (2 mks)

8. a) i) What is folding? (1 mk)

ii) Apart from recumbent fold, name two other types of folds. (2 mks)

iii) With the aid of labeled diagrams, describe how a recumbent fold in formed. (6 mks)

b) The map below shows some features in East Africa. Use it to answer question (i)

Name;

i) The mountains marked Q and R (2 mks)

ii) The lake marked S. (1 mk)

c) i) Give two differences between a normal and a reverse fault. (2 mks)

ii) describe how fault block is formed (5 mks)

d) Explain three negative effect of faulting on human activities. (6 mks)

9. a) i) Differentiate between a drainage basin and a watershed (2 mks)

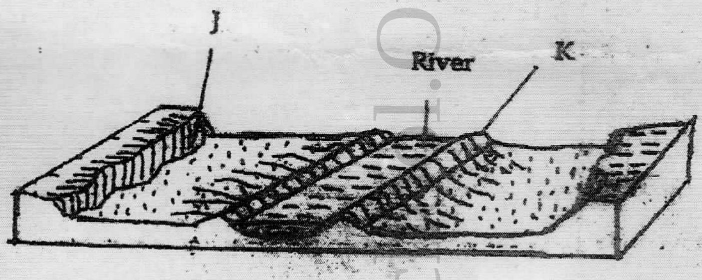
ii) Identify two types of river erosion (2 mks)

b) Describe two processes through which a river transports its load (4 mks)

c) i) Explain three causes of river rejuvenation. (6 mks)

ii) Describe how a pot hole in a river is formed. (3 mks)

d) i) The diagram given shows a flood plain.



Name the features marked J and K (2 mks)

ii) Explain three positive effects of floodplains to human activities. (6 mks)

10. a) i) State two conditions necessary for the formation of ice. (2 mks)

ii) Name three processes of ice movement. (3 mks)

b) Explain three factors which influence the rate of glacial erosion (6 mks)

c) With the aid of well labeled diagrams, describe how a corrie lake is formed. (8 mks)

d) Suppose students from your school were to carry out a field study on features of glaciation in low land areas of glaciated landscape.

i) Name two depositional features they are likely to study (2 mks)

ii) State two problems they are likely to experience during the field study (2 mks)

iii) State two methods that they will use to present data. (2 mks)