

NAME ADM NUMBER

SIGNATURE

DATE

121
MATHEMATICS
TIME: 2½ HRS
OCTOBER 2016

EXAMINATION
 KENYA CERTIFICATE OF SECONDARY EDUCATION (K.C.S.E)

MATHEMATICS
 OCTOBER 2016
 Time: 2½ hours

INSTRUCTIONS TO CANDIDATES

1. Write your name and admission number in the spaces provided above.
2. Sign and write the date of examination in the spaces provided above.
3. This paper consists of **two** sections: **I** and **II**
4. Answer **all** the questions in Section **I** and any **five** questions from Section **II**.
5. Show all the steps in your calculations giving your answers at each stage in the spaces below each question.
6. Marks may be given for correct working even if the answer is wrong.
7. Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

FOR EXAMINER'S USE ONLY

SECTION I

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

SECTION II

QUESTION	17	18	19	20	21	TOTAL
MARKS						

GRAND TOTAL

SECTION I (50 MARKS)

Answer all the questions in this Section in the spaces provided.

1. Express 2700 as products of prime factors.

(2 marks)

2. The GCD and LCM of three numbers are 12 and 360 respectively. Two of the numbers are 24 and 60. Find the LEAST possible value of the third number.

(3 marks)

3. Express the recurring decimal $0.185185 \dots$ as a fraction.

(3 marks)

4. Evaluate $\frac{0.18 \times 1.05 \times 0.32}{4.5 \times 0.06 \times 0.98}$ to 4d.p.

(3 marks)

5. A bus uses 2 litres of diesel for every 16km. The bus has to travel 320km and has 25.5 litres of diesel in the fuel tank. How much more diesel does the bus require to just complete the journey?
(3 marks)

6. Evaluate;

$$-24 \div 3 + 4 \times 25 - 8 \div 2 \times 10 - 1$$

(3 marks)

7. Express as a single fraction in its simplest form;

(4 marks)

$$\frac{1}{2} - \frac{3x+y}{2x+2y}$$

8. Eight men working 12 hours a day take $7\frac{1}{2}$ days to complete a piece of work. How long would it take ten men working 6hrs a day to complete the same work?

(3 marks)

9. A wheel of diameter 21 cm completes 1200 revolutions per minute. Find the speed of a point on the rim in cm per second. (Take $\pi = \frac{22}{7}$)

(4 marks)

10. 200cm^3 of acid is mixed with 300cm^3 of alcohol. If the densities of acid and alcohol are 1.08g/cm^3 and 0.8g/cm^3 respectively, calculate the density of the mixture. (4 marks)

11. Use tables of squares to evaluate;
 $(0.3418)^2$

(3 marks)

12. Use substitution method to solve the simultaneous equations;

$$\begin{aligned}x + 2y &= 5 \\3x - 2y &= 7\end{aligned}$$

(3 marks)

13. The price of a book in England is UK£ 4.25. The same book cost Ksh 550 in Kenya. Express UK£ price as a percentage of the Kenyan price taking $1\text{UK£} = \text{Ksh } 120.20$. (3 marks)

14. The area of a sector of a circle of radius 60cm is 33cm^2 . Calculate the central angle of the sector. (3 marks)

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15. A father is 20 years older than his son. 12 years ago he was six times as old as his son. Find their present ages. (3 marks)

16. Kamau shared Ksh 116580 between his wife, daughter and son in the ratio 1:2:3 respectively. His wife decided to divide her share equally between her daughter and son. Determine how much the daughter finally got. (3 marks)

SECTION II (50 MARKS)

Answer ALL the questions in the spaces provided

17. Copy and complete the tables (i) and (ii) below for the functions;
 $y = 7 - 3x$ and $y = 2x - 8$ respectively

i) $y = 7 - 3x$

(2 marks)

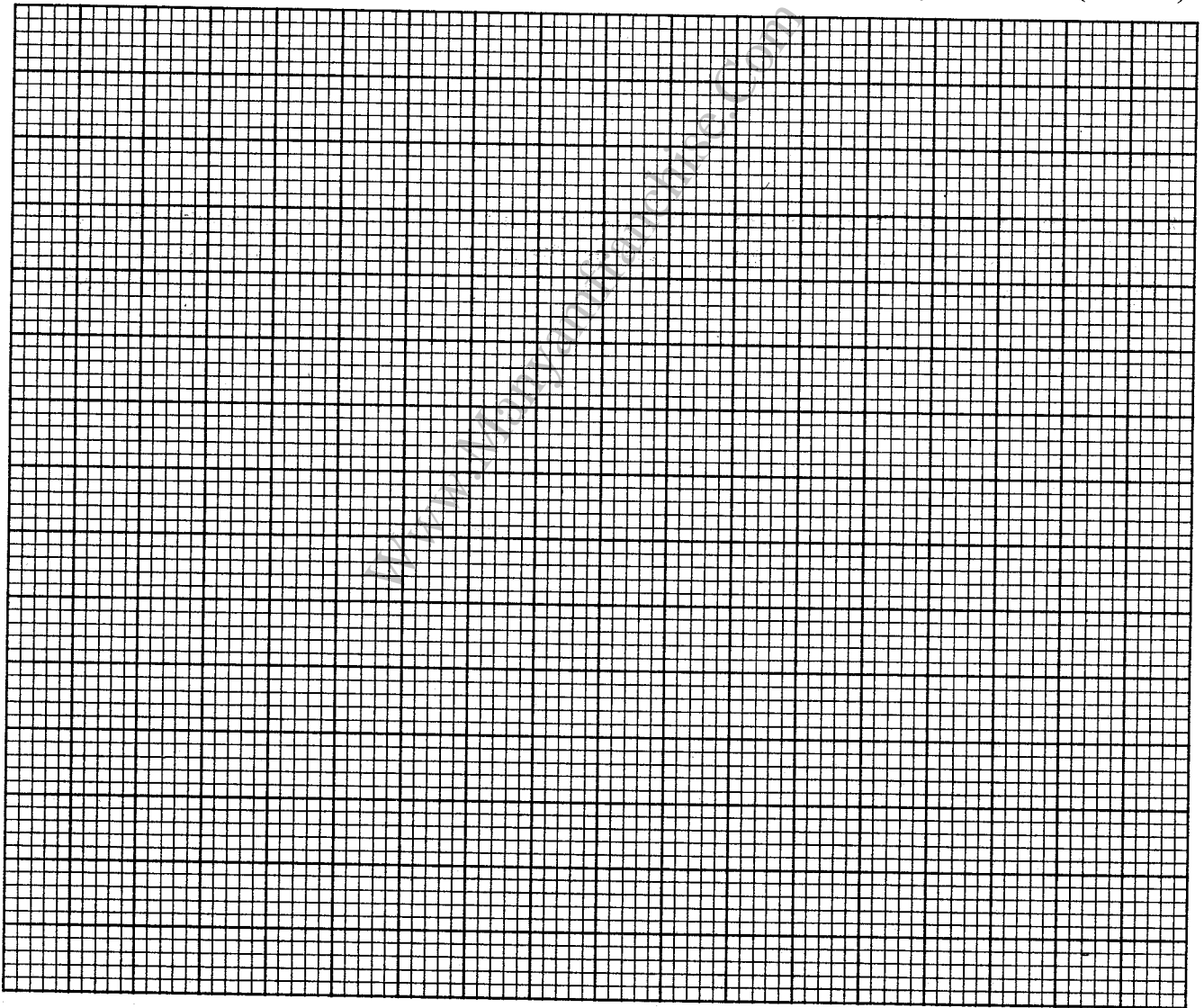
x	-2	-1	0	1	2	3	4	5
y	13		7					

ii) $y = 2x - 8$

(2 marks)

x	-4	-2	0	2	4	6	8	10
y	-16		-8			4		

- b) On squared paper and on the same grid, draw the graph of $y = 7 - 3x$ and $y = 2x - 8$. (4 marks)



- c) Use your graphs to solve the simultaneous equations;

(2 marks)

$$3x + y = 7$$

$$2x - y = 8$$

18. A rectangular cabin measurement 6.5m long, 4.8m wide and 3m high is constructed using wooden planks. The cabin has two doors each measuring 2.0m by 1.02m and four windows each measuring 90cm by 60cm. Each wooden plank measures 1.8m by 15cm and costs sh 45.50. Apart from doors and windows, all the walls, the floor and the ceiling are covered with the wooden planks.

Calculate

a) The total area covered with planks.

(6 marks)

b) The number of planks used.

(2 marks)

c) The cost of the planks used to construct the cabin.

(2 marks)

19. Four points A, B, C and D are situated on a horizontal plane such that B is 200m on a bearing of 065° from A. C is 300m on a bearing of 120° from B and D is 150m due West of C.

a) Draw a rough sketch showing the positions of the four points. (1 mark)

b) Using a suitable scale, draw an accurate scale drawing representing the positions of A, B, C and D. (5 marks)

c) By measurement, use your scale drawing to find the distance and bearing of
i) D from A (2 marks)

ii) B from D (2 marks)

20. a) A hardware dealer bought a wheelbarrow for sh 1200 and sold it at a profit of 25%. Find his actual profit and the selling price. (3 marks)

b) A trader offers a Christmas sale with a discount of 10% on all her merchandise. If Judy buys goods worth sh 9500, how much does she actually pay to the trader? (3 marks)

c) In one month, a motor vehicle salesman sold 3 motor vehicles, one at sh 1.5 million, another sh 750,000 and the other at sh 200,000. If he is paid a commission of 7%, how much did he get? (4 marks)

21. a) Use table of square roots to evaluate;

(3 marks)

$$\sqrt{0.007564}$$

b) The angle of a quadrilateral ABCD in order are $2(x - 10)$, $4(x + 5)$, $5(x + 4)$ and $(x - 20)$ in degree.
Find the exterior angles of the quadrilateral. (4 marks)

c) Evaluate $\frac{\frac{3}{4} + 1\frac{5}{7} \div \frac{4}{7}}{1\frac{3}{7} - \frac{5}{8}}$ of $2\frac{1}{3}$

(3 marks)