FORM ONE
TERM 2 2023
121/1
MATHEMATICS (Alt. A)
July/August 2023 – 2 ½ hours

Name: …… **Adm No**: …….

School: …….. **Class**: ……..

Signature: …….. **Date**: ……...

Instructions to candidates

a) *Write your name and admission number in the spaces provided above.*
b) *Write your class, the date of examination and sign in the spaces provided above.*
c) *This paper consists of two sections; Section I and Section II.*
d) *Answer all the questions in Section I and only five questions from Section II.*
e) *Show all the steps in your calculations, giving your answers at each stage in the spaces provided below each question.*
f) *Marks may be given for correct work even if the answer is wrong.*
g) *Non – programmable silent electronic calculators and KNEC Mathematical tables may be used, except where stated otherwise..*
h) *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*
i) *Candidates should answer the questions in English.*

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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	Total

Grand Total

SECTION I (50 Marks)

*Answer **all** the questions in this section in the spaces provided.*

1. Without using a calculator, evaluate $\dfrac{-8+(-5)\times(-8)-(-6)}{-3+(-8)\div 2\times 4}$ (3 marks)

2. Oilibya filling station in Machakos makes a profit of Ksh. 520 for every 1000 litres of petrol sold and Ksh. 480 for very 1000 litres of diesel sold. In a certain month the dealer sold twice as much diesel as petrol. If the total fuel sold that month was 900,000 litres, find the dealer's profit for the month. (4 marks)

3. When a number is divided by 30, 45 and 54, there is always a remainder of 29. Find the least possible number. (3 marks)

4. Ariell has 36 chemistry books, 32 biology books and 28 physics books. She wishes to arrange the books in groups such that each group has the same number of each book without any book being left out. Calculate the maximum number of books that can be found in each group. (3 marks)

5. Given that (5m - 2n) : (2m - n) = 7 : 5. Find the ratio m : n. (3 marks)

6. Express $2.\dot{9}0\dot{9}$ in the simplest form possible. (3 marks)

7. A mother is three and a half times as old as her daughter now. Five years ago, the sum of their ages was equal to the mother's age four years from now. Taking the daughter's present age as d years, find the mother's actual age in 15 years. (3 marks)

8. A forex Bureau in Kenya buys and sells currencies as below.

	Buying (Kshs.)	Selling (Kshs.)
1 Euro	144.60	146.10
1 US Dollar	132.50	133.40

A businessman from America converted 20,730 Euros into Kenya shillings.

a) Calculate the amount of money in Kenya shillings that he received. (1 mark)

b) The businessman spent Kshs 2,410,300 while in Kenya. He then converted the remaining Kenyan Shillings into US Dollars. Calculate the amount of money, to the nearest US Dollars, that he received. (2 marks)

9. A football match last 90 minutes with a break of 15 minutes at half - time. If a referee allows five minutes extra for injuries and stoppages, what time does a match which kicks off at 4.30 pm end? (3 marks)

10. Evaluate and simplify without using calculator; (4 marks)

$$\frac{3\frac{1}{5}+\frac{1}{4}\ of\ 3\frac{1}{2}-5\frac{1}{6}}{2\frac{2}{3}-1\frac{2}{5}\div 1\frac{1}{3}+3\frac{3}{4}}$$

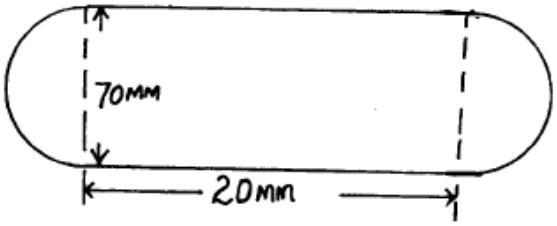
11. A school club has 60 members enrolled to go for a trip in bus. If 12 less members had enrolled for the trip, each member would pay Sh. 50 more towards the cost of transportation. If actually 50 members go, how much does each pay? (3 marks)

12. In a fundraising committee of 45 people, the ratio of men to women is 7:2. Find the number of women required to join the existing committee so that the ratio of men to women is changed to 5: 4. (3 marks)

13. Without using table or calculators, evaluate $\sqrt{\frac{0.0032+0.0608}{1.44x0.4}}$ (3 marks)

14. A number N is formed by arranging all the odd numbers between 1 and 10 in descending order. Another number M is formed by arranging all the square numbers between 1 and 10 in ascending order. Use tables of square root to evaluate: $\sqrt{N+M}$ (3 marks)

15. The figure below (not drawn to scale) shows the cross-section of a metal bar of length 3 metres. They are equal semi circles.



Determine the mass of the metal bar in kilograms if the density of the metal is 9.6 g/cm3.
(4 marks)

16. Write in figures and give the place value and total value of the third digit in the number; three million, seventy nine thousand, seven hundred and fifty nine. (2 marks)

SECTION II (50 Marks)

*Answer only **five** questions from this section in the spaces provided.*

17. Senjeni and Mkimwa entered into a business partnership in which they contributed Kshs. 120,000 and Ksh. 150,000 every year respectively. After one year, Kuku joined the business and contributed Kshs. 90,000.

a) Calculate the ratio of their investment after 3 years of business. (3 marks)

b) It was agreed that 30% of the profits after 3 years be used to cater for the cost of running the business, while the remaining would be shared proportionally. Calculate each persons share, if the profit made after three years was Kshs. 187,000. (4 marks)

c) If each of them invested their shares back in the business, find their new individual investments at the beginning of the fourth year. (3 marks)

18. Konza School constructed a water reservoir in the form of a rectangular cuboid measuring 4 m long, 3 m wide and 2.5 m high to serve a number of students.

a) Determine the capacity of the reservoir in litres. (4 marks)

b) Each student uses an average of 15 litres per day. The reservior tank can last the students 4 days. All the students used the water for 2 days after which 400 students were sent home for school fees. How many more days will the water last the remaining students? (6 marks)

19. A salesman sells cell phones at Sh. 15,000 each. He is paid a salary of Sh. 20,000 per month and commission on sales above Sh. 1,000,000 was paid in slabs as scheduled below.

Value of sales	Commission
1,000,001 – 2,000,000	2.5%
2,000,001- 2,500,000	3%
Above 2,500,000	4%

On a certain month, he sold 150 cell phones. Calculate his earnings that month. (4 marks)

(b) The following month, his salary was increased by 20%. If his total earnings were Sh. 90,000. Calculate

(i) The total amount received from sales (4 marks)

(ii) the number of cell phones sold (2 marks)

20. Three business partners, Bela Joan and Trinity contributed Kshs 112,000, Ksh, 128,000 and Ksh, 210,000 respectively to start a business. They agreed to share their profit as follows:

30% to be shared equally

30% to be shared in the ratio of their contributions

40% to be retained for running the business.

If at the end of the year, the business realized a profit of ksh 1.35 Million. Calculate:

a) The amount of money retained for the running of the business at the end of the year. (1 mark)

b) The difference between the amounts received by Trinity and Bela (6 marks)

c) Express Joan's share as a percentage of the total amount of money shared between the three partners. (3 marks)

21. SGR travel schedule from Nairobi to Mombasa is a below.

TOWN	DEPARTURE	ARRIVAL
Nairobi	2030h	
Emali	2310h	2215h
Mtito Andei	0205h	0135h
Mariakani	0515h	0440h
Mombasa		0650h

Using the table above, find;

a) Time taken by the train between Nairobi and Emali. (2 marks)

b) Stoppage time at Mtito Andei. (2 marks)

c) Time taken between Emali and Mariakani. (2 marks)

d) Total time taken for the journey. (2 marks)

e) Average speed of the journey if the total distance covered is 651km. (2 marks)