**NAME** …………………………………………………………. **ADM NO** ………………….

**SCHOOL** …………………………………………………………… **DATE** ……………………

 **CANDIDATE’S SIGNATURE** …………………..

 **MATHEMATICS FORM 1**

**DECEMBER 2021**

 **TIME:** $2^{1}/\_{2} HOURS$

**END OF TERM TWO 2021 EXAMINATIONS**

**Kenya Certificate of Secondary Education**

**MATHEMATICS**

**INSTRUCTIONS TO CANDIDATES**

1. Write your name, admission number and school in the spaces provided.
2. This paper consists of two sections; **Section I** and **Section II.**
3. Answer ALL the questions in Section I and Section II.
4. All answers and working must be written on the question paper in the spaces provided below each question.
5. Show all the steps in your calculations, giving your answer at each stage in the space provided below each question.
6. Marks may be given for correct working even if the answer is wrong.
7. Non programmable silent electronic calculators and **KNEC** mathematical tables may be used except where stated otherwise.
8. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

FOR EXAMINORS 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 the spaces provided.**

1. A farm worker digs a rectangular farm which is 35 metres by 45 metres. If should be paid Sh. 2 000 per hectare, calculate how much he should be paid. (3 marks)
2. Find the least number of sweets that can be packed into polythene bags which contain either 9 or 15 or 20 or 24 sweets with none left over. (3 marks)
3. Evaluate; (3 marks)

$14÷\frac{1}{3} of 5\frac{1}{4}+3 \frac{3}{4} ×1\frac{1}{3}$

1. A water pipe has an external radius of 4.9 cm and internal radius of 3.5 cm. Find the mass of 20 m of the pipe if it is made of material of density $10 gcm^{-3}$. (3 marks)
2. Simplify the expression

 $\frac{2}{3}\left(3x -2\right)– ¾ \left(2x -2\right)$ (3 marks)

1. If $f=\frac{uv}{u+v} $, find $f$ correct to 3 d.p, given that $u = 0.5$ and $v = 0.8$. (3 marks)
2. A square has an area of $36 cm^{2}.$ If the perimeter of the square increases by 30%, calculate the new perimeter. (3 marks)
3. A man is $x$ years old now. In 10 years’ time, he will be twice as old as he was 5 years ago. How old will he be in 10 years’ time? (3 marks)
4. A Kenyan tourist left America through South Africa. While in South Africa, she bought a wrist watch worth 24 dollars. Given that $1 South African rand=0.15 dollars $ and $1 rand=11.24 kenya shillings$, find the value of the watch in;
5. South African rands. (1 mark)
6. Kenya shillings. (2 marks)
7. A solid block in the shape of a cylinder has a height of 14 cm and weighs 22 kg. If it is made of material of density $5 gcm^{-3}$ , find the radius of the cylinder. Take $π=\frac{22}{7}$ (3 marks)
8. Evaluate $16^{2}×25^{2}$ by factorization leaving your answer as a product of prime factors. (3 marks)
9. An arc PQ of a circle of radius 15 cm subtends an angle of $160°$ at the centre of the circle. Find the length of the arc PQ correct to 2 significant figures.(Take $π=3.142$). (4 marks)
10. Evaluate;
11. $56÷-8×7+5-2$ (2 marks)
12. $-\left(-32\right)÷-4$ (2 marks)
13. Express the following recurring decimal as a fraction  (3 marks)
14. A church service lasted 2 hours 35 minutes. What time did it start if it ended at 12.15 p.m?

Express your answer in 24 – clock system. (3 marks)

1. Use tables of squares and square roots to evaluate; (3 marks)

$$11.98^{2}+\sqrt{231.5}$$

**SECTION II (50 Marks)**

**Answer all question in the spaces provided.**

1. a)Half the sum of the present ages of a mother and her daughter is equal to the difference between their ages now. In ten years time the mother’s age will be exactly twice the daughter’s age. Calculate their present ages. (3 marks)

b) In fourteen years’ time, a mother will be twice as old as her son. Four years ago, the sum of their ages was 30 years. Find how old the mother was, when the son was born. (4 marks)

c) Khadija and Kagendo bought the same types of pens and exercise books from the same shop. Khadija bought 2 pens and 3 exercise books for Sh 78. Kagendo bought 3 pens and 4 exercise books for Sh 108.Calculate the cost of each item. (3 marks)

1. The inside of a rectangular hall measures 15 m long, 9 m wide and 3 m high. There are two doors each measuring 2 m by 2.2 m and six windows each measuring 1.5 m by 1.5 m. The walls are to be painted.
2. Calculate the total area of the walls to be painted. (4 marks)
3. To paint an area of $2.5 m^{2}$ requires one litre. If the paint is sold in 4 litre tins, determine the number of tins of paint that should be bought. (3 marks)
4. The cost of a 4 litre tin of paint is Sh. 1 700. The painter is paid fixed charge of Ksh. 2 000 and Ksh. 30 per square metre of the wall painted. Calculate the total cost of painting the walls. (3 marks)
5. A cylindrical container of diameter 14 cm and depth 20 cm is half full of juice.
6. Calculate the volume of juice in the container in cubic metres. (3 marks)
7. The juice is to fill a rectangular tank whose dimensions are $1.5 m by 1 m by 0.5 m$. Calculate the number of cylindrical containers required to fill the tank to the nearest whole number. (3 marks)
8. A cube has a surface area of $216 cm^{3}$
9. Calculate the volume of the cube in cubic metres. (3 marks)
10. Find the capacity of the cube in litres. (1 mark)
11. Jane is a sales executive earning a salary of Ksh. 20,000 and a commission of 8% for the sales in excess of Ksh 100,000. If in January 2010 she earned a total of Ksh.48, 000 in salaries and commissions.
12. Determine the amount of sales she made in that month (4 marks)
13. If the total sales in the month of February and March increased by 18% and then dropped by 25% respectively. Calculate
14. Jane’s commission in the month of February (3 marks)
15. Her total earning in the month of March (3 marks)
16. In order to start a business, three businessmen Macharia, Omondi and Kimtai contributed Sh 25 000, Sh 35 000 and Sh 45 000 respectively as business capital. They also had to pay Sh 15 000 more as rental fee for business premises. The rental fee was shared equally among the partners. The three partners agreed to put 25% of the annual profits back in the business and share the rest in the ratio of their contributions. During the first year the business realized Sh 128 000 in gross profits.
17. Find the ratio in which they contributed business capital and rental fees. (2 marks)

1. Calculate;
2. The profits shared. (2 marks)
3. Each partner’s share of the profits. (6 marks)