**Name ADM NO**

**Class Date**

MATHEMATICS

FORM 1

SEPTEMBER 2022

**OPENER EXAMINATION TERM 3, 2022**

TIME: 2 ½ HOURS

**Kenya Certificate of Secondary Education 2022**

**INSTRUCTIONS TO CANDIDATES**

1. *Write your name and admission number in the spaces provided at the top of this page.*
2. *This paper consists of two sections:* **Section I and Section II.**
3. *Answer* ***al****l questions in* **section I** and Section **II.**
4. *Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.*
5. *Marks may be given for correct working even if the answer is wrong.*
6. ***KNEC*** *Mathematical tables may be used.*

**For Examiner’s Use Only**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **Total**  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** |
|  |  |  |  |  |  |  |  |

**Grand**

**Total**

**SECTION I (50 Marks)**

**Answer all questions in the spaces provided**

1. Evaluate $\frac{1}{3}$of (2 $\frac{3}{4}$ $-$ 5 $\frac{1}{2}$ ) x $\frac{36}{7}÷$ $\frac{9}{4}$ (3marks)
2. There are 59 996 books in a library. In the junior section there are 35 772 books while the adult section has 21 387. The rest of the books are in the reference section. Calculate how many books are in the reference section. (3 marks)
3. A trader made loss of 20% by selling an iron box at k.sh 2400
4. Calculate the buying price of the iron box (1 mark)
5. Find the percentage profit the trader would have made if he had sold it at Sh 3300

 (3marks)

1. The mass of a solid cylinder of radius 14cm and height of 18cm is 5.544 kg .Find its density in g/cm3 (use $π=$$\frac{22}{7})$(3 marks)
2. Arrange the following fractions in descending order (2 marks)

$\frac{13}{7},$ $\frac{5}{3},\frac{16}{9}$, $2\frac{2}{3}$, $1\frac{1}{3}$

1. Express as a fraction **3.**$\dot{4}\dot{5}$ (3marks)
2. A Kenyan tourist left Germany for Kenya through Switzerland. While in Switzerland, he bought a watch worth 52 Deutsche marks. The exchange rate was as follows:

1 Swiss France = 1.28 Deutsche Mark

 1 Swiss France = 45.21 Kenya Shillings

 Find the value of the watch in Kenya Shillings. (3 marks)

1. Evaluate without using a calculator (3 marks)

$$\frac{23.4-2\left(5.2+5.3\right)}{3.2×1.2}$$

1. A mother is six times as old as her son. In five years time, the sum of their ages will be 45. Calculate the present age of the mother (3 marks)
2. Evaluate without using mathematical tables or the calculator $\frac{1.9×0.032}{20×0.0038}$ (3 marks)
3. Use factorization to find the square root of the following:
4. 6084 (2 marks)
5. 39.69 (2 marks)
6. If **O** is the centre of the part of the circle shown below and radius of the circle is 2.1 cm find the area of the figure $\left(use π=\frac{22}{7}\right)$ ( 3marks)



1. Using elimination method, find the values of *x* and *y* in the equations. (3 marks)

$$5x-8y=0.5$$

$3x+2y=2$

1. Find the length of an arc of a circle of radius 42cm if it subtends an angle of 1200 at the center of the circle. $\left(use π=\frac{22}{7}\right)$ (3 marks)
2. A cylindrical container of radius 1.4m and 6m high is half –filled with water .Find the capacity of water in the container in litres $\left(use π=\frac{22}{7}\right)$ (3 marks)
3. When a certain number $x$ is divided by 30, 45 or 54, there is always a remainder of 21. Find the least value of the number $x$(3 marks)

 **SECTION II (50 Marks)**

**Answer all questions in the spaces provided**

1. (a) An open cylindrical water tank was constructed to store water. If the radius of the tank was 3.5 m and height 6 m, what was its internal surface area? (3 marks)

(b) The area of a rectangular field that is 240m wide is 8.4 ha. Find the perimeter of the field in metres. (3 marks)

(c) An HDPE pipe of length 50 m, 0.3 cm thick is made of polystyrene material. If the internal diameter of the pipe is 100 cm, calculate the volume of the material used in making the pipe. Give your answer to 4 d.p in $m^{3}$. (4 marks)

1. The following is travel timetable for a bus operating between towns Limuru and Unguja 400km apart

|  |  |  |
| --- | --- | --- |
| Town  |  Arrival  | Departure  |
| Limuru |  | 0730h |
| Nakuru | 0905h | 0930h |
| Kericho | 1100h | 1110h |
| Kisumu | 1310h | 1320h |
| Unguja | 1400h |  |

1. How long does it take to travel from Limuru to Nakuru (2marks)
2. For how long does the bus stay at Kericho (2marks)
3. How long does it take to travel from Limuru to Unguja (2marks)
4. How long does it take to travel from from Nakuru to Unguja (2marks)
5. Calculate the average speed for the whole journey (2marks)
6. A group of 120 people planned to contribute sh.2, 400,000 to start a business. However before the contributions were made 40 members pulled out.
7. Find the initial amount of money each member in the group was to contribute. (2 marks)
8. After the 40 members pulled , calculate the new amount each member contributed (2marks)
9. Twenty new members joined the group just before the business started. As a result the old members were to be refunded some money. How much was the refund per member. (3 marks)

 **d) C**alculate the percentage change between the amount to be contributed by 120 members and the one contributed by 80 members. (3marks)

1. A jug holds $3\frac{1}{2}$ litres of water. A tank containing 120 litres is to be emptied using the jug.
2. How many jugs are filled in the process? (2 marks)
3. What fraction of the jugs capacity will be the last portion of water from the tank? (2 marks)
4. Evaluate (3 marks)

$$\frac{1}{2}+\frac{\frac{1}{3}+\frac{1}{2}}{\frac{1}{5}of \left(\frac{2}{5}-\frac{1}{6}\right)}$$

1. A loaf of bread costs Sh. 22.50. If a crate has 25 loaves of bread, calculate how much a crate of bread costs. Express the answer in standard form. (3 marks)
2. A sales woman is paid a commission of 4 % on the sale of goods worth over k.sh 150,000 .She is also paid a monthly salary of k.sh 18000 .In a certain month she sold 600 bags at Sh 1250 each.
3. Calculate her earnings that month (3marks)
4. The following month the sales woman’s monthly salary was increased by 15% .Her total earnings that month were k.sh 79,200 .Calculate
5. Total amount of money received from the sale of bags that month (5 marks)
6. Number of bags sold that month (2marks)