121/ 1 Mathematics Paper 1
FORM 1 2024
END TERM 1 – Time: 2 ½ hours

Marking Scheme

Name ..... **Admission Number**.....

Candidate's Signature ..... **Date** .....

Instructions to candidates

1. Write your name, admission number and class in the spaces provided above.
2. The paper contains two sections: **Section I** and **Section II**.

Answer **ALL** the question

1. s in **Section I** and **ANY FIVE** questions from **Section II**.
2. All working and answers must be written on the question paper in the spaces provided below each question.
3. Marks may be awarded for correct working even if the answer is wrong.
4. Negligent and slovenly work will be penalized.
5. Non-programmable silent electronic calculators and mathematical tables are allowed for use.
6. ***This booklet contains 17 printed pages. Please confirm that all the pages exist and are properly printed before starting the exam.***

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	Total

Grand Total %

SECTION I (50 MARKS)

Answer all the questions in this section.

1. Write the following numbers in words (3 marks)

   i. 900079

   Nine Hundred Thousand and Seventy nine.

   ii. 17006952

   Seventeen million, and Six thousand nine hundred and Fifty two.

   iii. 3000020739

   Three billion, twenty thousand seven hundred and thirty Nine.

2. Find the sum of all prime numbers between 0 and 50. (3 marks)

   2+3+5+7+11+13+17+19+23+29+31+37+41+43+47

   328

3. State the place values of the following digits in 52368700941 i. (4 marks)

   6: Tens of Millions ii. 5: Tens of billions

   iii. 2: Ones of billions

   iv. 9: Hundreds

4. The sum of four consecutive numbers is 102. Find the numbers. (3 marks)

Let the 1st Number be k

$k + k+1 + k+2 + k+3 = 102$

$4k + 6 = 102$

$4k = 102 - 6$

$4k = 96$

$\frac{4k}{4} = \frac{96}{4}$

$k = 24$

Hence, 24, 25, 26, 27 ⇐ Ansn

5. Arrange the following fractions in descending order. $\frac{2}{3}, \frac{4}{7}, \frac{7}{10}$ (3 marks)

⇒ Solution,

Express as a percentage

$\frac{2}{3} \times 100\% \Rightarrow 66.67\%$

$\frac{4}{7} \times 100\% \Rightarrow 57\frac{1}{7}\%$

$\frac{7}{10} \times 100\% \Rightarrow 70\%$

$\frac{7}{10}, \frac{2}{3}, \frac{4}{7}$ ⇐ Ansn

6. The GCD and LCM of three numbers are 3 and 504 respectively. If two of the numbers are 24 and 72 respectively, find the least possible value of the third number. (3 marks)

$\text{LCM} \times \text{GCD}$

LCM of two numbers

$\frac{3 \times 504}{72}$

2	24	72
2	12	36
2	6	18
3	3	9
3	1	3
	1	1

72

Ansn ⇒ 21

7. Find the perimeter of a square whose area is 289 cm^2. (3 marks)

$A = S^2$

$\sqrt{S^2} = \sqrt{289}$

$S = 17$

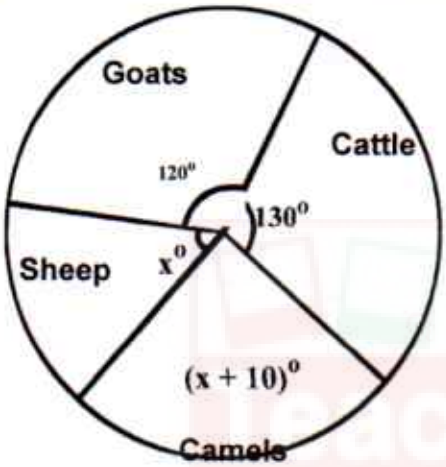
Perimeter of a square $= S \times 4$

$S \Rightarrow$ Sides

17×4

$\Rightarrow 68\ cm \Leftarrow$ Ansn.

8. A farmer has four types of animals on his farm. The pie chart below represents the number of animals on the farm. If the number of goats were 30, calculate the number of camels on the farm. (4 marks)



$\frac{120}{360} \rightarrow ?$

Proceed as follows

$120^\circ + 130^\circ + X^\circ + X + 10^\circ = 360^\circ$

$260 + 2X = 360$

$\frac{2X}{2} = \frac{100^\circ}{2}$

$X = 50^\circ$

Camels $= 60^\circ$

$\frac{120^\circ}{360} \rightarrow 30$

$\frac{60}{360}$

$= \frac{60}{360} \times \frac{30}{120} \times \frac{360}{1}$

No of camels

$\Rightarrow 15 \Leftarrow$ Ansn

9. Factorise $4pqr^2 + 6p^2qr^2 - 2pq^2r^2$ (3 marks)

$2pqr^2(2 + 3p - q)$

$\Rightarrow 2pqr^2(2 + 3p - q) \Leftarrow$ Ansn

10. Convert 0.427 into fraction. (3 marks)

~~n = 0.427.2727~~ $r = 0.\ 4\ 2\ 7\ 2\ 7$ ——

~~1000n = 427~~ $10r = 4.\ 2\ 7\ 2\ 7\ 2$ ——

$1001r = 427.2727$

$\frac{996r}{996} = \frac{423}{996}$

$r = 4\frac{7}{10}$

11. Evaluate $\dfrac{8\frac{1}{8} - 2\frac{1}{2}}{5\frac{3}{20} - 1\frac{1}{6} \text{ of } 1\frac{1}{5}}$ (3 marks)

BODMAS

Numerator $\Rightarrow$ $5\frac{5}{8}$

subtract

Denom $\Rightarrow$ $1\frac{3}{5}$ From $5\frac{3}{20}$

$5\frac{3}{20} - 1\frac{2}{5}$

$3\frac{3}{4}$

$\frac{15}{4} \times \frac{4}{11} = 1\frac{1}{2}$ $\Rightarrow$ Ans

12. Work out $1305 \quad (670 \quad 235) \quad 6 \quad 780 \quad 13$?? (3 marks)

13. Is 43516902 divisible by 11? Show your working. (3 marks)

get the sum of alternative digits.

$4+5+6+0 = 15$

$3+1+9+2 = 15$

$15 - 15 = 0$, Hence divisible by 3

14. Express the following in terms of their prime factors. (3 marks)

i. 72

$2^3 \times 3^2$ ← Ansk

ii. 686

$7^3 \times 2^1$ ← Ansm

iii. 1152

$2^7 \times 3^2$

15. Evaluate 55.31 + 100.184 – 143.9455 leaving your answer in standard form. (3 marks)

100.184
55.310
155.4940
143.9455
11.5485

1.15485×10^1 ← Ansl

16. Show that 35600 is divisible by 8 and not 3. (3 marks)

Divisibility test of 8 - A number is divisible by if the last 3 digits is divisible by 8.

$\frac{600}{8} = 75$ ⇒ hence divisible

Divisibility test of 3 ⇒ If the sum of digits is divisible by 3. 3+5+6+0+0 = 14 aint divisible by 3

3

SECTION II (50 MARKS)

Answer any FIVE questions in this section.

17. Use squares and square root tables to solve the following (10 marks)

(i) $4.56^2 - \sqrt{30.4}$

20.7936 - 5.5136

⇒ 15.2800 = Ans

(ii) $\sqrt{0.846} + \sqrt{0.095}$

0.9198 + 0.3082

1.2280 - Answ

(iii) $20.7^2 - \sqrt{10486}$

428.49 - 102.4012

530.8912 = Answ

(iv) $0.7865^2 - \sqrt{0.007267}$

0.6186 - 0.0852

0.5334 ⇒ Ans w

(v) $7.059^2 - \sqrt{1850}$

49.8295 - 43.0116

6.8179 = Ans 7

18. (a) Without using mathematical tables or a calculator, evaluate $\frac{2^7 - 4^{\frac{5}{2}}}{4^{\frac{1}{2}}}$ (5 marks)

(b) A fruit dealer blends the fruit juice in a common container to the brim before choosing the quantities in which to distribute them. She can pack them in either 20 litres, 24 litres or 36 litres can before selling them. If she chooses 20 litres cans she remains with 13 litres while when she uses 24 litres 17 litres remain in a container and 29 litres remain when distributed in 36 litres cans. Determine the least capacity of her container in litres. (5 marks)

LCM

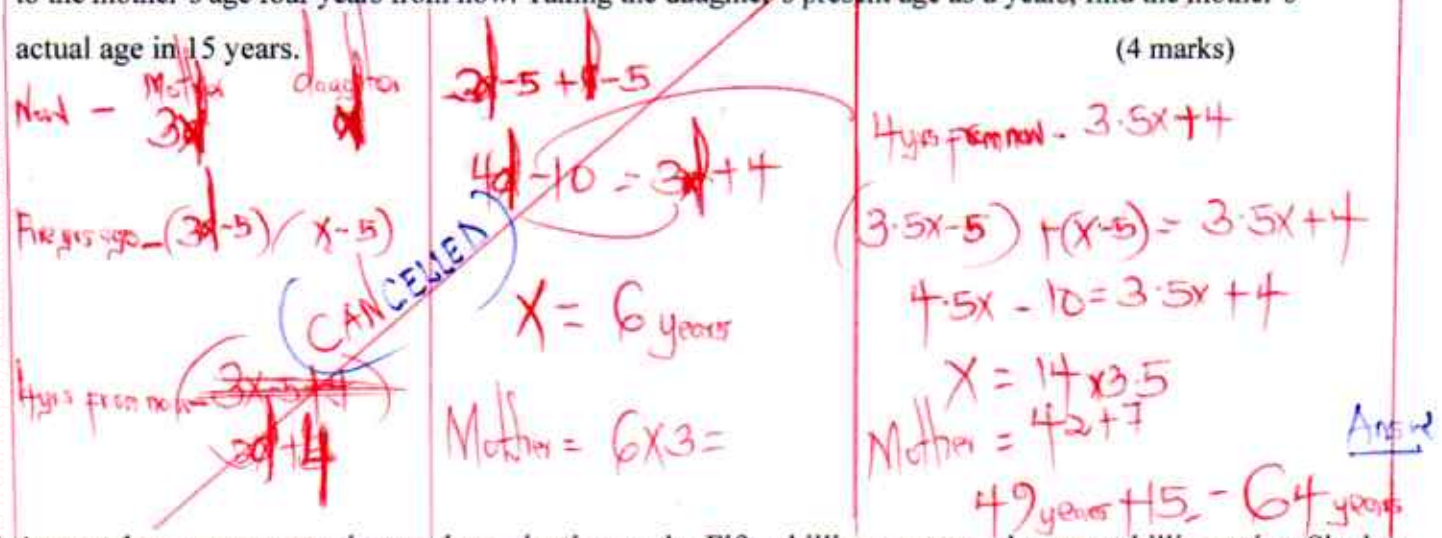
2	20,	24,	36
2	10	12	18
2	5	6	9
3	5	3	9
3	5	1	3
5	5	1	1
	1	1	1

8

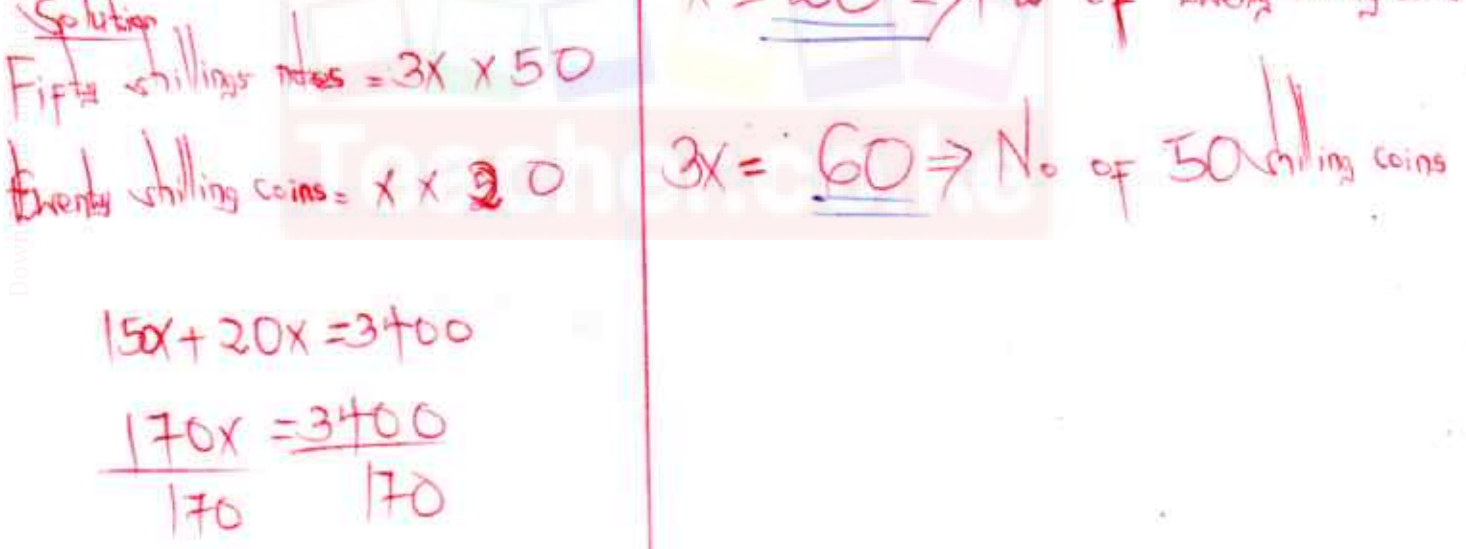
$= 2 \times 2 \times 3 \times 3 \times 5$

$4 \times 9 \times 5$

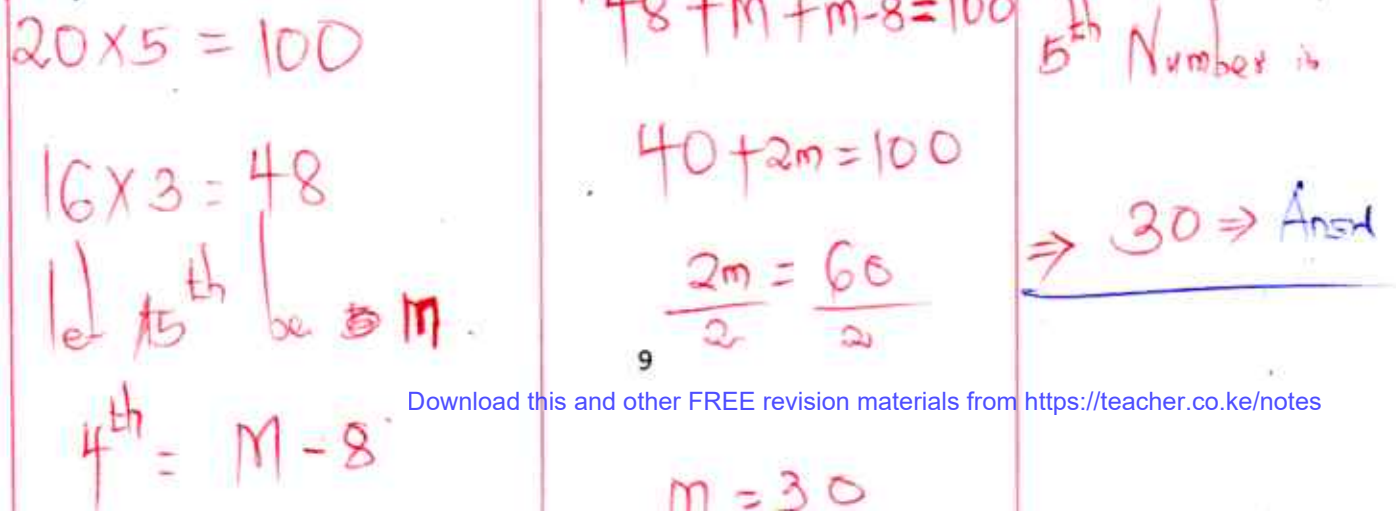
19. (a) A mother is three and a half times as old as her daughter now. Five years ago, the sum of their ages was equal to the mother's age four years from now. Taking the daughter's present age as d years, find the mother's actual age in 15 years. (4 marks)



(b) Annette has some money in two denominations only. Fifty shillings notes and twenty shilling coins. She has three times as many fifty shilling notes as twenty shilling coins. If altogether she has sh. 3,400, find the number of fifty shilling notes and 20 shilling coin. (3 marks)

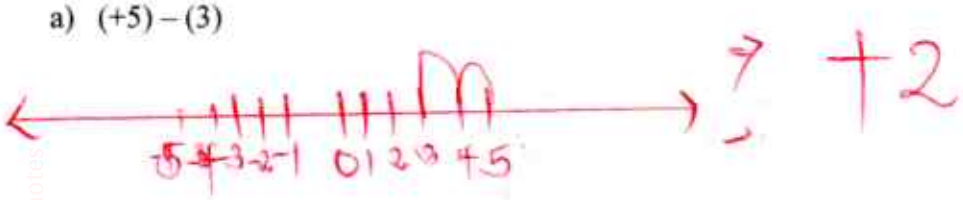


(c) The mean of five numbers is 20. The mean of the first three numbers is 16. The fifth number is greater than the fourth by 8. Find the fifth number. (3 marks)



20. Use number lines to perform the following operations (10 marks)

a) (+5) – (3)

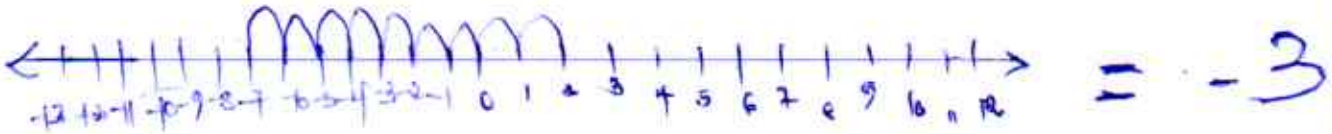


b) (-4) + (2)

c) (+2) + (+5) + (-8)

d) (-3) + (+6)- (-2)

e) (+2) + (-6) – (+3) – (-4)



21. (a) The area of a triangle whose height is equal to the length of its base is 40.25 cm^2. Calculate the length of the base. (3 marks)

Area of triangle

$= \frac{1}{2} \times b \times h$

$\frac{1}{2} \times s^2 = 40.25$

$\frac{s^2}{2} = 40.25$

$\sqrt{s^2} = \sqrt{80.5}$

$s = 8.972\ cm$

(b) Without using a calculator and tables, evaluate (4 marks)

$$\frac{11.7 \times 0.036 \times 5.8}{130 \times 1.45 \times 7.2}$$

$\frac{117}{10} \times \frac{36}{1000} \times \frac{58}{10} \times \frac{1}{130} \times \frac{100}{145} \times \frac{10}{72}$

$\Rightarrow 0.0018$

$\Rightarrow \frac{18}{10,000}$ ← Ansh

(c) A vegetable vendor had 1348 cabbages. He sold 750 on the first day and 240 on the second day. He added 466 to the remaining stock on the third day. (3 marks)

(i) How many cabbages did he have at the end?

Original $= 1348 - (750 + 240) + 466$

824 ← Ansh

(ii) If he sold the cabbages at a cost of shs 15, how much money did he get?

824×15

$\Rightarrow$ sh 12360 ← Ansh