BROAD EXAMINATIONS©

PRE-PLE SPECIAL SET 2023

MATHEMATICS

Time allowed: 2 hours 30 minutes.

Random No.						Personal No.		

Candidate's Name: T.R AMBROSE 0756235548 / 070 143 9949.

Candidate's Signature.....

School Name: RWEIBARE II P/S

District Name: MBARARA.

Read the following instructions carefully:

1. This paper is made up of two sections: A and B.
2. Section A has 20 questions (40 Marks).
3. Section B has 12 questions (60 Marks).
4. Answer ALL questions in both sections A and B.
5. All answers must be written in the space provided in blue or black ball point pens and ink. Only diagrams should be done in pencil.
6. Unnecessary crossing of answers will lead to loss of marks.
7. Any handwriting, which cannot be easily read, may lead to loss of marks.
8. Do not fill anything in the boxes indicated for Examiners' use only.

Pre-PLE Special 2023

FOR EXAMINERS' USE ONLY		
QN. No	MARKS	SIGN
1-10		
11-20		
21-22		
23-24		
25-26		
27-28		
29-30		
31-32		
TOTAL		

SECTION .A. (40 Marks)

1. Subtract: 96
   −32
   64

2. Expand 507 using values.

	PV	Value
507		
Ones	7×1	7
Tens	0×10	0
Hundreds	5×100	500

= 500 + 0 + 7.

3. If set B = { }, how many subsets are in set B?

Number of subsets = 2^n ∴ Set B has 1 subset.

$1 = 2^n$

$2^0 = 2^n$

$n = 0$

4. Find the sum of the missing numbers in the sequence.

2, 3, 5, 7 11, 13, 17

Prime Numbers.

Sum

11
+17
28

5. The range of two numbers is 7. If the smaller number is −3, find the larger number.

Let the larger number be k.

Range = Highest − Lowest.

$7 = k - (-3)$

$7 = k + 3$

$7 - 3 = k + 3 - 3$

$k = 4$

6. Decrease 490 pigs by 30%.

Before decrease	After decrease
100%	100% − 30%
	70%
490 pigs	

100% → 490 pigs
1% → $\frac{490}{100}$
70% → $\frac{490}{100} \times 70$
= 343 pigs.

7. A bank teller issued out notes numbered from MP0000489 to MP0000509 consecutively. How many notes did he issue out?

Number of notes = (Last note's no − First number) + 1

MP 0000509
− MP 0000489
20 + 1
= 21 notes.

8. Write in figures; Eighty seven thousand nine hundred forty one.

Eighty Seven thousand → 87,000
Nine hundred → 900
Forty One → + 41
87,941

9. **Add;**

Mins	Secs
5	30
+3	40
9	10

(30 + 40)sec = 70sec
1 min → 60sec
70 ÷ 60
1min and 10sec

10. Using a ruler, a pencil and a pair of compasses only, bisect a line segment AB below.

11. Convert 0.75 tonnes into kg.

1 tonne ⟶ 1000kg

0·75 tonnes ⟶ $\left(\frac{75}{100} \times 1000\right)$ kg

$= 750$ kg.

12. When 480 rabbits are increased by X%, they become 552 rabbits. Find the value of X.

Before Increase	After Increase.
100%	100% + x
480 rabbits	552 rabbits

Increase

552
- 480

72 Rabbits.

% age Inc = $\frac{\text{Increase}}{\text{original number}} \times 100\%$.

$\frac{72}{480} \times 100\%$

$\frac{3}{72} \times \frac{5}{10}\%$

$3 \times 5\%$

$= 15\%$.

13. Solve; 2 - (x + 3) = 5

$2 - (x+3) = 5$

$2 - x - 3 = 5$

$-x - 3 + 2 = 5$

$-x - 1 = 5$

$-x - 1 + 1 = 5 + 1$

$\frac{-x}{-1} = \frac{6}{-1}$

$x = -6$

14. Convert 1.444..... to a common fraction.

Let the fraction be k

$k = 1.44\ldots$ (eqn 1)

Multiply both sides by 10

$k \times 10 = 1.44\ldots \times 10$

$10k = 14.44\ldots$ (eqn 2)

Subtract eqn 1 from 2

$10k = 14.44\ldots$

$-\ k = 1.44\ldots$

$\frac{9k}{9} = \frac{13}{9}$

$k = 1\frac{4}{9}$.

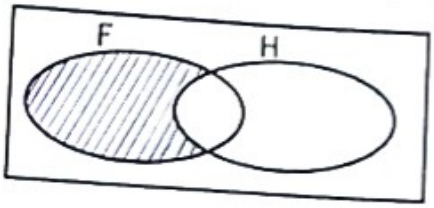
15. Write CXCVII in Hindu Arabic numerals.

C	XC	VII
100	90	7

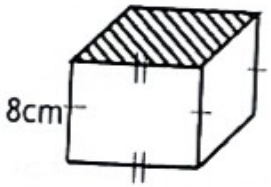
100 + 90 + 7

= 197

16. In the venn diagram below, shade F-H.



17. The area of the shaded part in the figure below is 120cm². Calculate the volume of the cuboid.



V = Base area x height

$120cm^2 \times 8cm$

$V = 960cm^3$

18. Find the interior angle of a regular dodecahedron whose interior angle sum is 1800°.

Int ∠ Sum = $180°(n-2)$

$1800° = 180°n - 360°$

$1800° + 360° = 180°n - 360° + 360°$

$2160° = 180°n$

$\frac{180°n}{180°} = \frac{2160°}{180°}$

$n = 12$

Ext ∠ = $\frac{\text{Ext ∠ Sum}}{\text{No of sides}}$

$\frac{360°}{12} = 30°$.

Int ∠ + Ext ∠ = 180°

Int ∠ + 30° = 180°

Int ∠ + 30° − 30° = 180° − 30°

Int ∠ = 150°.

19. Given that ⊕ = 20 pupils, how many pupils are represented by ⊕⊕⊕◔?

1 picture = 20 pupils

$3\frac{3}{4}$ Pictures $\longrightarrow \left(\frac{15}{4_1} \times \overset{5}{\cancel{20}}\right)$ pupils

= 75 pupils

20. A trader deposited sh. 600,000 in a bank which offers an interest rate of 5.5% p.a. Find the simple interest he earned in 3 months.

$SI = P \times R \times T$

Sh. $600{,}000 \times \frac{55}{10}\% \times \frac{3}{12_4}$

Sh. $600{,}000 \times \frac{55}{10} \div \frac{100}{1} \times \frac{1}{4}$

Sh. $600{,}\cancel{000} \times \frac{55}{1\cancel{0}} \times \frac{1}{1\cancel{00}} \times \frac{1}{4}$

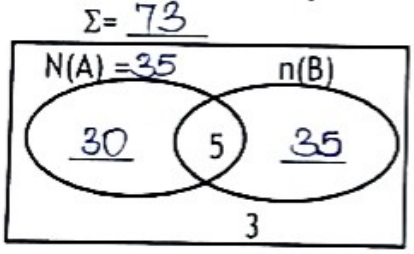
$SI = \text{sh.}\frac{8250}{33{,}000}$ / 4_1

SI = sh. 8250

SECTION .B. (60 Marks)

21. Given that n(A)=35, n(A∩B) = 5, n(B) =40, n(Σ)=73 and $n(A \cup B)^{l}$=3

(a) Complete the Venn diagram below.



B only
40 - 5
35

A only = 35 - 5
= 30

(b) Find n(A∪B).

$n(A \cup B) = 30 + 5 + 35$

$n(A \cup B) = 70$

(05 Marks)

22. In the magic square below, the sum of the values vertically, horizontally or diagonally is equal. Work out the values of the unknowns a, b, c and d.

a	2	9
8	6	b
3	c	d

Magic Sum.

$9 + 6 + 3 = 18$

Value of a

$a + 2 + 9 = 18$

$a = 18 - 11$

$a = 7$

Value of b.

$b + 8 + 6 = 18$

$b = 18 - 14$

$b = 4$

Value of c.

$C + 6 + 2 = 18$

$C = 18 - 8$

$C = 10$

Value of d

$d + C + 3 = 18$

$d + 10 + 3 = 18$

$d = 18 - 13$

$d = 5$

(05 Marks)

23. The median of four consecutive ~~even~~ odd numbers is 38.

(a) Find the numbers.

Let the numbers be m.

1st no	2nd no	3rd no	4th no	Sum	Median
x	x+2	x+4	x+6	38	

$\frac{x+2+x+4}{2} = 38$

$2 \times \frac{2x+6}{2} = 38 \times 2$

$2x + 6 = 76$

$2x + 6 - 6 = 76 - 6$

$\frac{2x}{2} = \frac{70}{2}$

$x = 35$

Numbers are:-

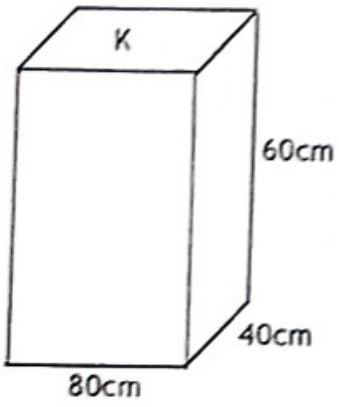
35, 37, 39, 41

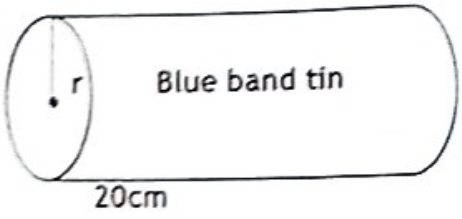
(b) Find the sum of the four ~~even~~ odd numbers.

$$\begin{array}{r} \text{Sum} = \overset{2}{3}5 \\ 37 \\ +39 \\ 41 \\ \hline 152 \end{array}$$

(05 Marks)

24. Joackim was given a task of packing cylindrical tins of blue band in big box (K) which is 80cm long, 40cm wide and 60cm high. He packed 4 small tins of blue band with height 20cm. After packing all the blue band tins, a space of 142720cm³ remained in the box.





(a) Calculate the volume of each tin.

Volume of the box

$V = L \times W \times H$

$80cm \times 40cm \times 60cm$

$V = 192,000cm^3$

Volume of tins

$192,000\ cm^3$

$-\ 142\ 720\ cm^3$

$49,280\ cm^3$

Radius of the tins

$V = 4(\pi r^2 h)$

$4 \times \frac{22}{7} r^2 \times 20 = 49,280cm^3$

$\frac{7 \times 176r^2}{7} = 49\,280cm^3 \times 7$

$\frac{176r^2}{176} = \frac{49,280cm^3 \times 7}{1760}$

$r^2 = 22 \times 7$

$\sqrt{r^2} = \sqrt{196}$

Radius $= 14cm.$

(b) Work out the radius (r) of the tin.

$4\pi r^2 h = 49,280\ cm^3$

$4 \times \frac{22}{7} r^2 \times 20cm = 49\,280cm^3$

$\frac{7 \times 1760cm\,r^2}{7} = 49,280cm \times 7$

$\frac{1760r^2}{1760} = \frac{49,280cm \times 7}{1760}$

$\sqrt{r^2} = \sqrt{196}$

$r = 14$

Volume of 1 tin

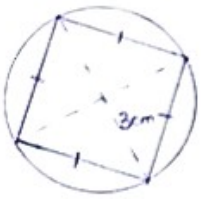
$49280cm^2 \div 4$

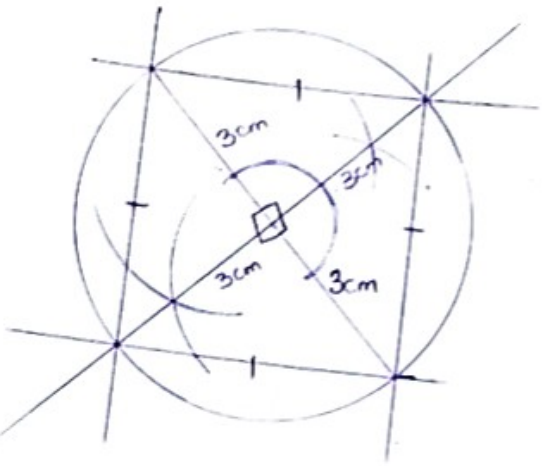
$12320cm^3$

(06 Marks)

25. (a) Using a ruler, a pencil and a pair of compasses only, construct a square in a circle of radius 3cm.

Sketch.





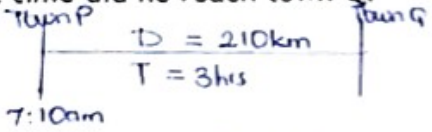
(b) Measure the length of each side.

(05 Marks)

Length = 4·1cm.

26. A taxi driver left town P at 7:10 a.m travelling to town Q. If he reached town Q after 3 hours covering a distance of 210 Km;

(a) at what time did he reach town Q?



7 : 10 am
+ 3 00 hrs
10 : 10 am

(b) at what speed was he travelling to reach town Q?

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\frac{210\text{ km}}{3\text{hrs}}$$

S = 70 km/hr

(04 Marks)

27. The table below shows exchange rates at KTB Forex Bureau in Uganda Shillings.

Currency	Buying (Ug.sh.)	Selling (Ug.sh.)
1 Kenya Shillings (Ksh.)	28	29
1 pound sterling (£)	4200	4500
1 United states dollar (US$)	3500	3700

(a) James had Ug. Sh.870,000, how much in Kenya shillings did he get from the bank?

1ksh ⟶ Ugsh 29.

Ugsh. 870.000 ⟶ $\frac{\text{Ugsh. } 870{,}000}{\text{Ugsh } 29}$

= ksh 30.000.

(b) **Okello** from Kenya had K Sh. 11,100, and wanted to visit America, how many US dollars did he get after the exchange?

1ksh ⟶ Ugsh. 28

Ksh. 11100 ⟶ Ugsh 28 × 11100

Ugsh. 310800

1us dollar ⟶ Ugsh 3700

$\frac{\text{Ugsh } 310800}{\text{Ugsh } 3700}$

= 84 us dollars

(05 Marks)

28. (a) Find the complement of (P+30°).

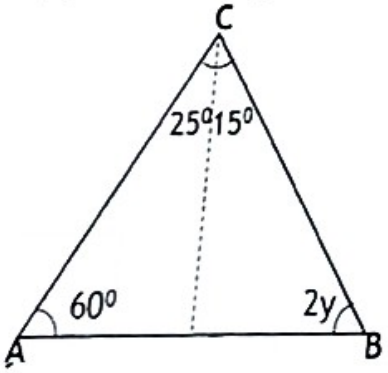
$90° - (P + 30°)$

$90° - P - 30°$

$90° - 30° - P$

$60° - P$.

(b) In the triangle below, find the value of angle ABC.



$2y + 60° + 25° + 15° = 180°$

$2y + 60° + 40° = 180°$

$2y + 100° = 180°$

$2y + 100° - 100° = 180° - 100°$

$\frac{2y}{2} = \frac{80°}{2}$

$y = 40°$

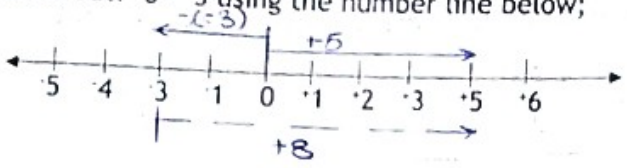
$\angle ABC = 2y$

$= 2 \times 40°$

$= 80°$.

(05 Marks)

29. (a) Work out: ·5 - ·3 using the number line below;



$+5 - (-3) = +8$.

(b) If today is Thursday, what day of the week will it be after 119 days?

$4 + 119 = \_\_ (\text{finite } 7)$ It will be Thursday.

$123 = \_\_ (\text{finite } 7)$

$123 \div 7 = 17 \text{ r } 4$

4 Stands for Thursday.

(05 Marks)

30. On Mr. Paul's animal farm, there are 20 more goats than cows. The number of sheep is a third the number of cows and goats. It is given that the number of goats is as much as the number of cows and sheep on the farm. Find the number of goats on Paul's farm.

Goats	cows	Sheep
$x+20$	x ~~+20~~	$\frac{1}{3}(2x+20)$

Goat $= x+20$

Cows $= x$

Sheep $= \frac{1}{3}(2x+20)$

$x+20 = x + \frac{1}{3}(2x+20)$

$x+20 = x + \frac{2x}{3} + \frac{20}{3}$

$(x+20)\times 3 = 3x\frac{2x+20}{3} + x\times 3$

$3x + 60 = 2x+20+3x$

$60 - 20 = 5x - 3x$

$\frac{40}{2} = \frac{2x}{2}$

$x = 20$

Number of Goats $= 20+20$ $= 40$ goats

(04 Marks)

31. The wheel of a lorry has a diameter of 280cm. The wheel makes 16,000 revolutions in 1 hour 36 minutes. Determine the speed of the lorry.

Circumference of the Wheel

$C = \pi D$

$\frac{22}{7} \times 280\text{cm}$

$C = 880\text{cm}$.

Total distance (TD)

Number of rev. $= \frac{TD}{\text{Circumference}}$

$880 \times 16000 = \frac{TD}{880\text{cm}} \times 880\text{cm}$

Total distance $= 14,080,000\text{cm}$

Distance in km.

1km $\longrightarrow$ 100,000cm.

14080000cm

$100,000\text{cm}$

$= \frac{1408}{10}$

140.8km.

$S = D/T$

$\frac{1408}{10}\text{km} \div 1\frac{36}{60}$

$\frac{1408}{10}\text{km} \div \frac{8}{5}\text{hrs}$

$\frac{1408}{10} \times \frac{5}{8}$

(05 Marks)

$S = 88\text{km/hr}$

32. The table below shows number of pupils in different classes at **Kyaka II P/S.**

CLASS	P.1	P.2	P.3	P.4	TOTAL
NO. OF PUPILS	30	50	60	40	180

(a) Complete the table above.

$180 - (30 + 50 + 40)$

$180 - 120$

$= 60$

(b) Using a radius of 3cm, show the information in the table above in a circle graph.

P.1

$\frac{30}{180} \times 360^{2}{}^{\circ} = 60^{\circ}$

P.2

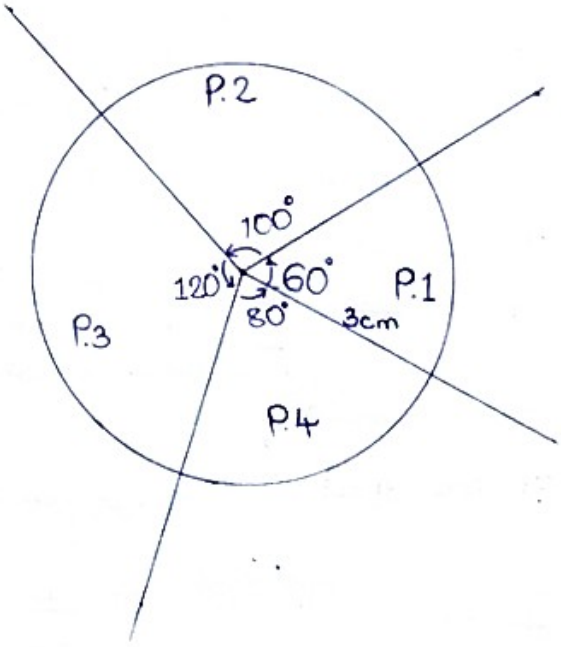
$\frac{50}{180} \times 360^{2}{}^{\circ} = 100^{\circ}$

P.3

$\frac{60}{180} \times 360^{2}{}^{\circ} = 120^{\circ}$

P.4

$\frac{40}{180} \times 360^{2}{}^{\circ} = 80^{\circ}$



(06 Marks)

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