Founded 1965

Sujatha Vidyalaya
Nugegoda

HIGHLANDS COLLEGE
Maharagama

Term / Year – Second Term Test - 2024	**Grade - 11**
Subject – Mathematics I	**Duration – 02 hours**

Name -

Index Number		**Register Number**	
Class		**Signature of Invigilator**	

Important :

- This paper consists of 8 pages.
- Write your Name, Class, Index Number, and the Register Number in the appropriate place on this page.
- Answer all questions in this paper itself.
- Use the space provided under each question for workings and writing the answer.
- Indicate the relevant steps and the units when answering the questions.
- Marks are awarded as follows :

  In Part A - 2 marks for each question

  In Part B - 10 marks for each question
- Use the first page as a cover page for Paper 1. Use an appropriately filled school cover page for Paper 2.
- In Paper 2, answer a new question in a new page.
- In Paper 2, staple pages from both sides.
- Choose easy questions to answer first.

For Marking Examiner's use only

Part	Question Number	Marks
Part A	1 - 25	
Part B	1	
	2	
	3	
	4	
	5	
Total		
Examiner's Signature		

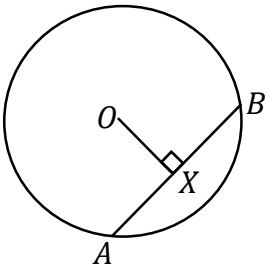
Paper 1 - Marks	
Paper 2 - Marks	
Total Marks	
Percentage	

Part A

1. If 6 men need 10 days to complete a certain job, how many days will it take for 5 men to complete the same job?

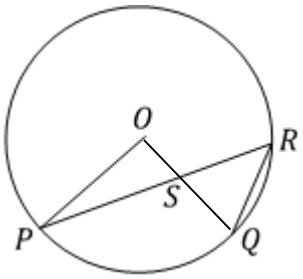
2. Find the least common multiple (LCM) of terms $12x^2y$, $15y^2$.

3. In the given figure, the length of chord AB of a circle with center O is 10 cm. Find the length of AX.

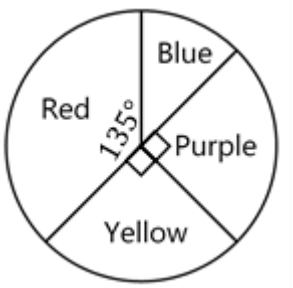


4. The length of a prism with a cross-sectional area of 20 cm² is 30 cm. Find its volume.

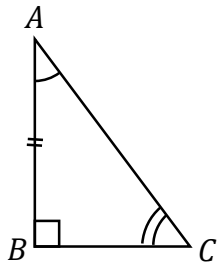
5. P, Q, R are 3 points on a circle with centre O. If $P\hat{O}Q = 100°$ and $R\hat{S}Q = 60°$, find the magnitude of $S\hat{Q}R$.

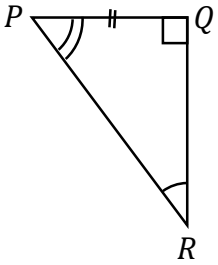


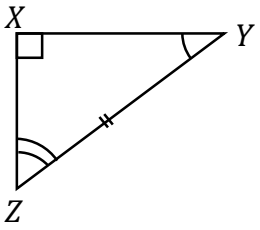
6. A group of kids in a preschool brought some balloons of various colors. The following pie chart shows the quantities of balloons for each color. If the number of red balloons is 45, find the number of blue balloons.

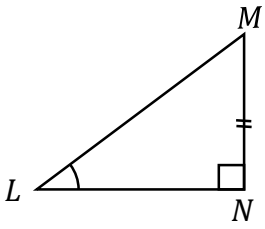


7. Choose the pair of congruent triangles from the triangles given below.









8. Write in the index form. $\lg 85 = 1.9294$

9. Only 7 dice, which are different only in colour from the total of 10 dice in a container, are black. Find the probability that a die taken at random from the container will **not** be black in colour.

10. The magnitudes of the three interior angles in a triangle are in the ratio 5:2:2. What type of triangle is it according to the lengths of its sides?

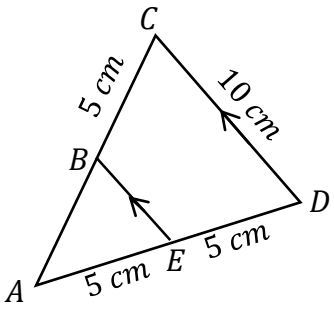
11. If the circumference of a right circular cylinder with a curved surface area of $880\ cm^2$ is $44\ cm$, find its height.

12. In a sports club, all who play football, also play cricket. If F = {members who play football} and C = {members who play cricket}, choose the correct one from the following expressions.

    i) $F \cap C = \emptyset$ ii) $F \subset C$ iii) $C \subset F$ iv) $F \cup C = \emptyset$

13. The gradient of a linear graph drawn on a distance-time plot to represent the motion of a vehicle is 6. If the axis denoting the distance is marked in metres and the axis denoting time is marked in seconds, determine the speed of the vehicle.

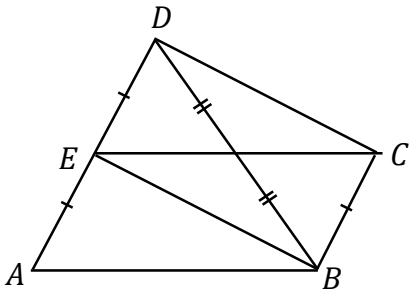
14. According to the information given in the figure, place a ✓ mark opposite the correct statements or a ✗ mark opposite the incorrect statements.



Statement	
$AB = BC$	
$AB = 5\ cm$	
$BE = 5\ cm$	
$A\hat{C}D = D\hat{A}C$	

15. Simplify. $\frac{2a^2b}{3a} \times \frac{15}{ab^2}$

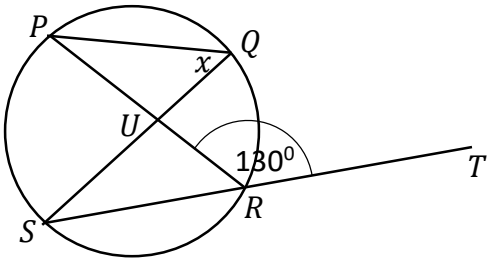
16. According to the information given in the figure, write a pair of parallel lines.



17. Solve the quadratic equation. $(x-5)(2x+1)=0$

18. According to the information given in the figure, find the magnitude of the angle denoted by x.

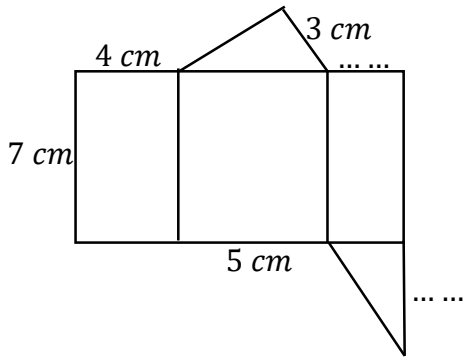
Given that, $U\hat{R}T = 130°$



19. Find the factors of the quadratic expression. $2x^2 - 9x + 9$

20. Find the first approximation of $\sqrt{7}$.

21. A pattern used to make a solid is given below. Write on dotted lines the related measurements of the sides.

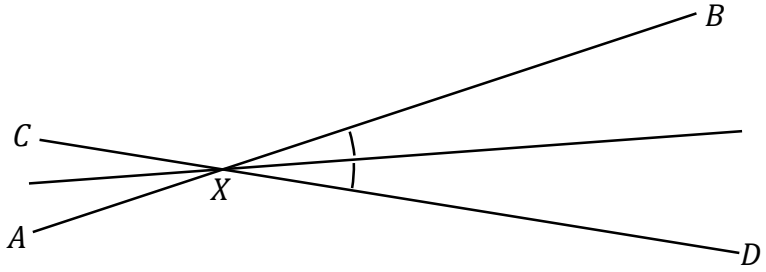


22. Find the gradient of the straight line passing through points (4,8) and (1,2)

23. Determine the quarterly rates charged for a household with an assessed annual value of Rs. 80 000 located in a local authority domain, where 6% of the assessed annual value is charged as annual rates.

24. Solve. $\frac{1}{4x} - \frac{1}{5x} = \frac{1}{10}$

25. The lines AB and CD intersect at X. Using the knowledge of loci, locate the point P which is equidistant from points B and X, and also equidistant from lines AB and CD.



Part B

1. $\frac{4}{15}$ of the capacity of a container is filled with cordial. When a certain volume of water is added to the container, the mixture fills up to $\frac{14}{15}$ of capacity of the container.

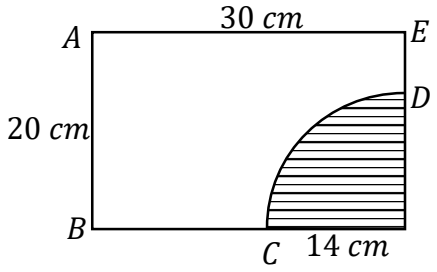
   i. Write the added volume of water as a fraction of the capacity of the container.

   ii. If $\frac{4}{7}$ of the mixture is served to visitors, express that volume as a fraction of the capacity of the container.

   iii. If the initial volume of cordial in the container is 600 ml, find the capacity of the container in milli litres.

   iv. If the volume in (ii) is divided equally among 3 visitors, find the volume served to each visitor.

2. The figure shows a piece of fabric ABCDE to be cut from a rectangular piece of cloth to make a dress. The shaded sector is the piece to be cut off.



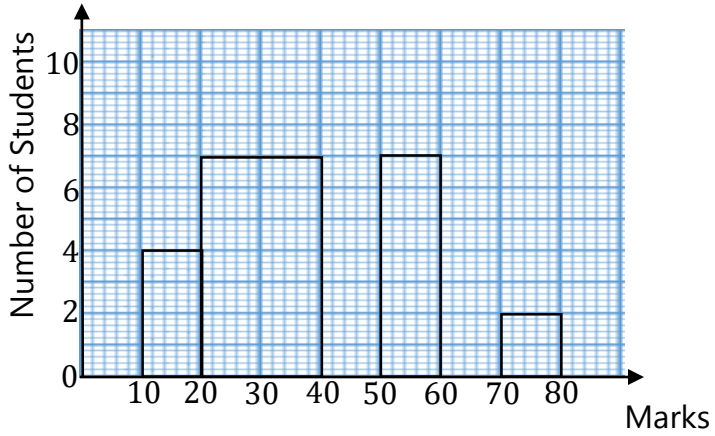
   i. Find the length of DE.

   Ii Determine the perimeter of the portion ABCDE.

   iii. Calculate the area of the piece to be cut off.

   iv. Find the area of the segment created when the cut off sector is cut into two along the straight line from C to D.

3. The following incomplete histogram and cumulative frequency table are prepared based on the marks obtained by 40 students in an examination.

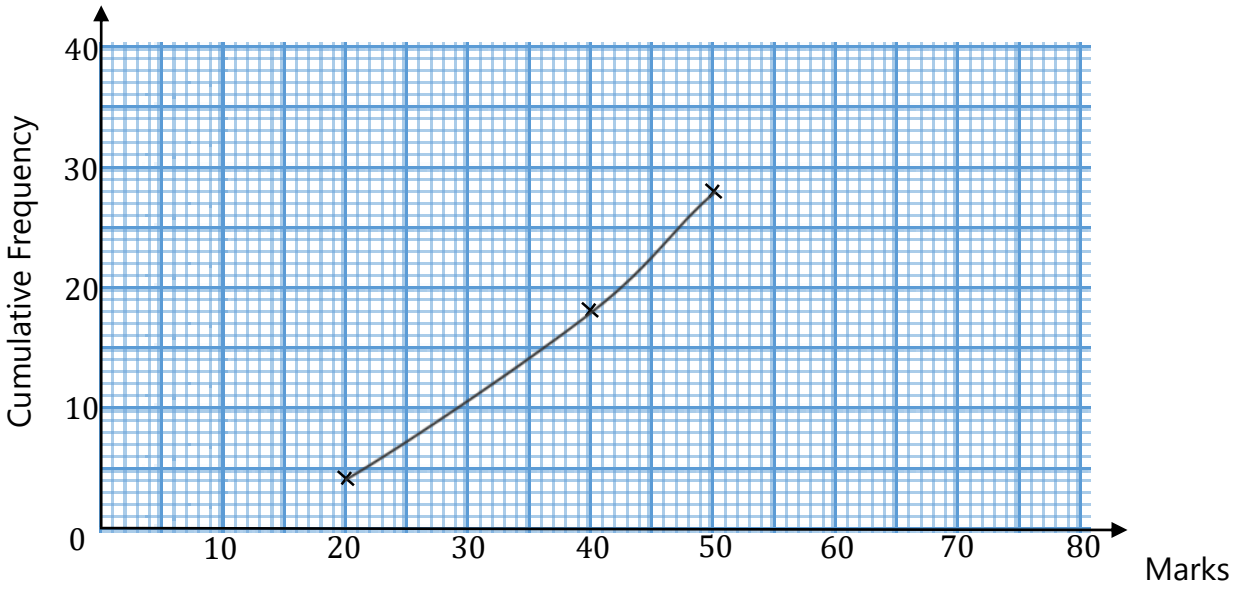


Class Intervals (Marks)	Number of Students (Frequency)	Cumulative Frequency
10 - 20	4	4
20 - 40		18
40 - 50	10	
50 - 60		35
60 - 70	3	
70 - 80	2	40

i. Complete the histogram.

ii. Complete the blanks in the table.

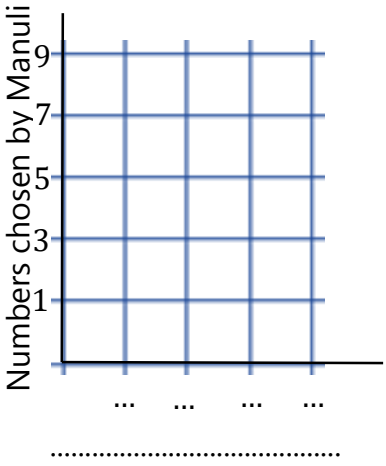
An incomplete cumulative frequency curve drawn based on the above information is given below.



iii. Complete the cumulative frequency curve.

iv. It is planned to conduct remedial classes for 25% of students who got the lowest marks. Find the cut off mark below which students are selected for remedial classes.

4. a)
Jayani and Manuli wrote the following two sets respectively.
$A = \{Whole\ numbers\ from\ 1\ to\ 4\}$
$B = \{Odd\ numbers\ greater\ than\ 0\ and\ less\ than\ 10\}$



i. Write the two sets listing their elements.

ii. Each student selects a number from their own set at random. Complete the following grid and represent the possible outcomes on the grid with an X mark.

ii. Mark the event that the number chosen by Manuli is greater than the number chosen by Jayani on the grid, and find its probability.

b)

i) Represent the event that the number chosen by Jayani is an odd or even number on a tree diagram and extend it to represent the event that the number chosen by Manuli is an odd number or even number."

ii) Find the probability of the event that both numbers are odd.

---

5. Ajantha bought 2 000 shares from a company, each at Rs. 25.

i. Find the amount he invested to buy shares.

ii. After receiving dividends, he sold all of his shares for a total of Rs. 48 000, Find the price at which he sold each share.

Iii If the total amount received from selling shares and dividend income is Rs. 52 000, find the dividend income per share.

iv. If he deposits the total amount received in a bank that pays a compound interest of 10% per year, determine the interest he receives for the second year.

Sujatha Vidyalaya
Nugegoda

HIGHLANDS COLLEGE
Maharagama

Founded 1965

Term / Year – Second Term Test 2024	**Grade - 11**
Subject – Mathematics II	**Duration – 03 hours**
Name -	

Important:

- *Answer **ten** questions selecting **five** questions from* **Part A** *and five questions from* **Part B.**
- *Write the **relevant steps** and the **correct units** in answering the question.*
- *Each question carries **10** marks*
- *The surface area of a cone with a base radius r and a slant height l is* πrl

Part A

*Answer **five** questions only.*

1. A TV set priced at Rs. 40 000 for outright purchase can be bought by making a down payment of Rs. 4,000 and paying the remaining amount in 12 equal monthly installments of Rs. 3 292.50. The interest is calculated on the reducing balance of the loan amount.

   i. Find what portion of the loan is to be paid monthly without interest.
   ii. Determine the annual interest rate applied to calculate the total interest.

2. A table of values prepared to draw the graph of a function is given below.

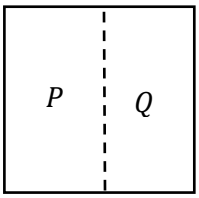
x	-2	-1	0	1	2	3	4
y	6	1	-2	-3	-2	1	6

   a)
   i. Using the standard system of axes and a scale of 10 small divisions to represent 1 unit along x and y axes, draw the graph of the function on graph paper, based on the provided table of values.

   b) Using the graph of the function,

   i. Write the equation of the axis of symmetry
   ii. Write values of x for which $y = 0$
   iii. Using the coordinate of the turning point, write the equation of the function in the form $y = \pm(x + a)^2 + b$, where a and b are integers
   iv. Using the answers for parts ii and iii, estimate $\sqrt{3}$ accurate to the first decimal place showing necessary workings.

3. A rectangular laminar of length $x\ cm$ and width $6\ cm$ was cut off from a square lamina of length $x\ cm$. The rectangular laminar is denoted by P in the figure.



   i. After cutting off portion P from the square lamina, the remaining portion is denoted by Q in the figure. Draw a rough sketch of the remaining portion with its measurements in terms of x.
   ii. If the area of the remaining portion Q is $20\ cm^2$, find the area of the square laminar of length $x\ cm$. (Take $\sqrt{29} = 5.4$)

4. A certain volume of water was stored in 40 vessels for the use of a camp. The following frequency distribution shows the information on how the volume of water was stored in vessels to the nearest litre.

Volume of Water (l)	10 - 12	13 - 15	16 - 18	19 - 21	22 -24	25 - 27
Number of vessels	3	8	9	11	7	2

   i. What is the modal class?
   ii. Write the upper limit and the lower boundary of the class interval 13 -15.
   iii. Estimate the mean volume of water in a vessel to the nearest litre.
   iv. Determine the highest total volume of water in litres that can be stored in the 20 vessels with the smallest individual volumes of water.

5. a) A company has a fleet of 20 vehicles consisting of trishaws and cars.

   i. Take x as the number of trishaws and y as the number of cars and build an equation to represent 20 vehicles.
   ii. Assuming there are 3 wheels for a trishaw and 4 wheels for a car, build another equation in terms of x and y to represent total number of 65 wheels.
   iii. Solve the above pair of equations to find values of x and y

   b) A few apples were bought to be shared equally among a group of kids. If each apple is cut into 5 equal parts, 4 kids will not receive any, and if each apple is cut into 6 equal parts, 3 parts will be left over. Take the number of apples bought as a, build a simple equation, and solve it to find the value of a.

6. a) A vertical tower XY is positioned at point X on a straight, horizontal road between two points, A and B, which are $80\ m$ apart. When the top of the tower Y is observed from point A, the angle of elevation is $43°$, and when observed from point B, the angle of elevation is $50°$.

   i. Include this information in a rough sketch. (Neglect the height of the observer.)
   ii. Draw a scale diagram to represent the above information, with a scale of $1\ cm$ to represent $10\ m$.
   iii. Using the scale diagram, estimate the true height of the tower XY.

   b) If the area of a sector with a radius of $6\ cm$ is $66\ cm^2$, find its angle at the centre. (Use $\pi = \frac{22}{7}$).

Part B

*Answer **five** questions only.*

7 The number of bulbs in the last circle of a light decoration created during the festival season is 100. The number of bulbs in the inner circles decreases according to the following arithmetic progression: 100, 97, 94, …

i. Find the common difference of the number sequence.
ii. Write the fourth and fifth terms in the number sequence.
iii. Find the sum of the first 20 terms (the total number of bulbs in the first 20 circles) using the formula.
iv. According to the sequence above and using arithmetic progression formulas, determine the maximum number of circles that can be created, given that each circle must contain more than 2 bulbs.

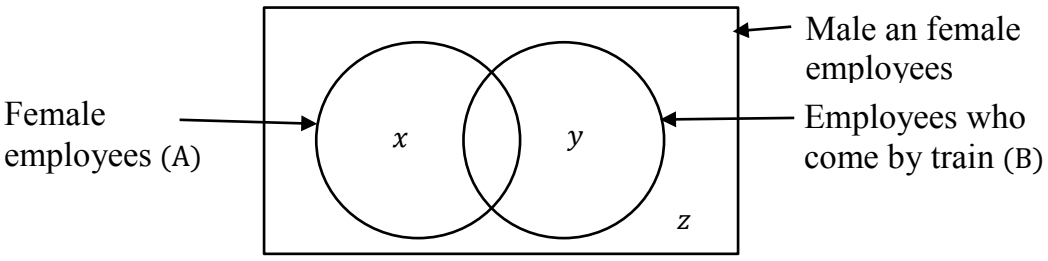
---

8. Use only a straight edge with a cm/mm scale and a pair of compasses for the following geometric constructions. Show the construction lines clearly.

i. Construct the line segment $AB = 10\ cm$.
ii. Construct the perpendicular bisector of AB and mark the point of intersection of AB and its perpendicular bisector as X.
iii. Mark point C on the perpendicular bisector such that $AC = 7\ cm$, and measure and write the length of CX.
iv. Using the Pythagorean relation, find the length CX, and hence estimate $\sqrt{6}$ accurate to the first decimal place.
v. Construct the triangle ABD such that point D is located on the side of the line AB opposite to point C, $AD = 4\ cm$, and $A\hat{D}B = 90°$.

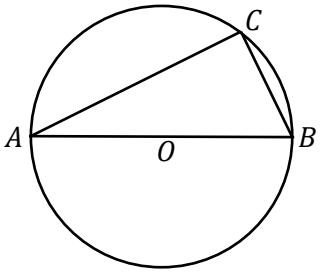
---

9 In a survey among female and male employees in an organization, 15 of them come by train and 18 of them are females. An incomplete Venn diagram to show the above information is given below.



i. Copy the Venn diagram and include the above information in it.
ii. If $n(A \cup B) = 26$, find $n(A \cap B)$.
iii. Find x and y separately.
iv. If the ratio between the number of employees who come by train and the number of employees who do not come by train is 3:4, determine the number denoted by z.

10. Point C lies on a circle with centre O, and AB is a diameter of the circle.



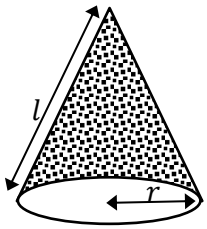
i. Name a right angle in the figure.
ii. Copy the figure and draw line OX such that X lies on AC and $A\hat{O}X = 90°$.
iii. In the figure, name another angle that is equal to $A\hat{B}C$.
iv. If the radius of the circle is r, prove that $r = \sqrt{\frac{1}{2}\ AC.AX}$

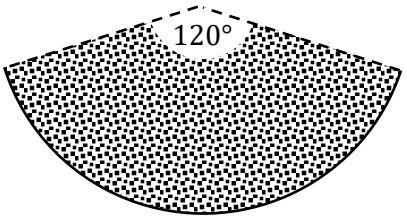
---

11. a)

When the curved surface of a hollow cone with a base radius r and slant height l is cut along a slant height and unfolded, it forms a sector with an angle at the centre $120°$.

Show that $r = \frac{1}{3}l$





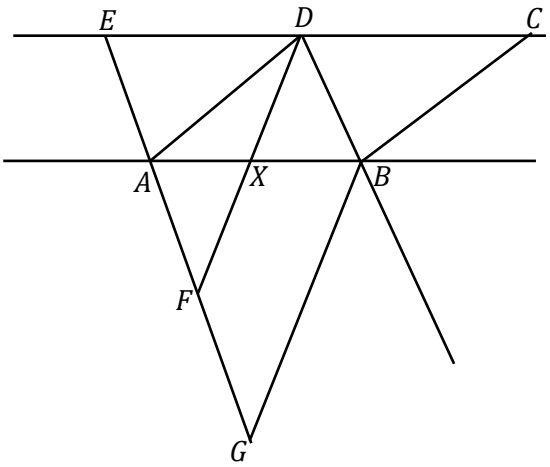
b)

If $a = 7.32, x = 12.8, y = 0.56$, and $A = \frac{a\sqrt{x}}{y}$, find the value of A using logarithms tables.

12.

a) Write the theorem on the relationship between areas of parallelograms that lie on the same base and between the same pair of parallel lines.

b) In the figure, ABCD and ABDE are two parallelograms. F and G lie on EA produced such that BDFG is a parallelogram. DF and AB intersect each other at X.
Prove that the Area of BXFG = the Area of ΔADX + the Area of $\Delta\ BCD$.



Set by Vajirapani Aravinda
Translated by Megha Saliya Lokugeegana

PARCEL NO

LOL.lk
BookStore

විභාග ඉලක්ක
පහසුවෙන් ජයගන්න

ඕනෑම පොතක් ඉක්මනින්
නිවසටම ගෙන්වා ගන්න

කෙටි සටහන් | පසුගිය ප්‍රශ්න පත්‍ර | වැඩ පොත් සඟරා | O/L ප්‍රශ්න පත්‍ර |
A/L ප්‍රශ්න පත්‍ර | අනුමාන ප්‍රශ්න පත්‍ර | අතිරේක කියවීම් පොත් |
School Book ගුරු අතපොත්

PADANAMA PUBLICATION
pesuru Prabashana Private Ltd.
Akura Pilot
සමනල දැනුම
T
සතර

පෙර පාසලේ සිට උසස් පෙළ දක්වා සියළුම ප්‍රශ්න පත්‍ර,
කෙටි සටහන්, වැඩ පොත්, අතිරේක කියවීම් පොත්, සඟරා

සිංහල සහ ඉංග්‍රීසි මාධ්‍යයෙන් ගෙදරටම ගෙන්වා ගැනීමට

www.LOL.lk වෙබ් අඩවිය වෙත යන්න