



Royal College - Colombo 07
රාජකීය විද්‍යාලය - කොළඹ 07

32	E	I
----	---	---

Grade 11 - First Term Test – April 2025
පළමු වාර පරීක්ෂණය -2025 අප්‍රේල්- 11 ශ්‍රේණිය

Mathematics - I
ගණිතය - I

Time: 2 hours
කාලය : පැය 2

Name / Index No:.....

Certified Correct

.....
Signature of Invigilator

Important:

- ❖ This paper consists of 8 pages.
- ❖ Write your **Index Number** correctly in the appropriate places on this page and on page three.
- ❖ Answer all questions on this paper itself.
- ❖ Use the space provided under each question for working and writing the answer.
- ❖ It is necessary to indicate the relevant steps and the correct units in answering the questions.
- ❖ Marks will be awarded as follows.
Two marks each for questions 1 - 25 in part A.
Ten marks each for questions in part B.
- ❖ A blank paper can be obtained for rough work from the supervisor on your request.

For Marking Examiner's use only

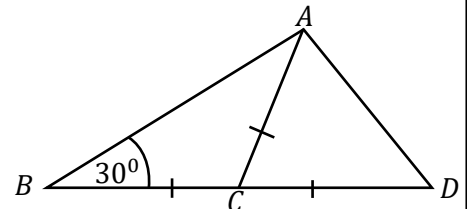
Part	Question Number	Marks
A	1 - 25	
B	1	
	2	
	3	
	4	
	5	
Total		
Signature of Invigilator		



PART -AAnswer **all** questions on the **paper itself**.(Take the value of π as $\frac{22}{7}$)

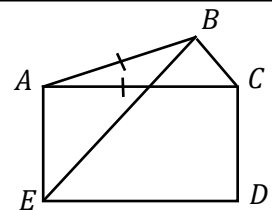
- 1) If Rs. 200 has to be paid as quarterly rates for a house which lies within the limits certain urban council that charges annual rates percentage of 8%, Calculate the annual assessed value of the house.

- 2) In the given diagram $BC = AC = CD$ and $\hat{ABC} = 30^\circ$. Find the value of $\hat{BAD}$.



- 3) Find the least common multiples of the following algebraic terms.
 $6m^2n$, $12mn^2$, $18mr^2$

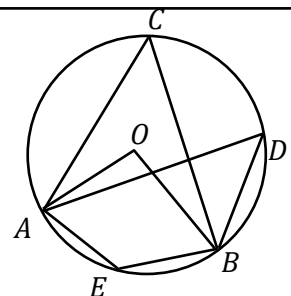
- 4) $ACDE$ is a rectangle. If $\hat{ACB} = 65^\circ$ and $AB = AC$, find the magnitude of $\hat{BAE}$.



- 5) If $\log_2 128 = x$, find the value of x .

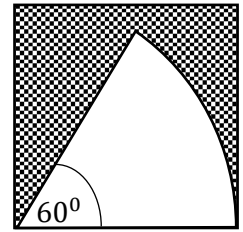
- 6) Simplify: $\frac{2m^2n}{5} \div \frac{12mn^2}{25}$

- 7) Centre of the circle is O. If $\hat{AOB} = 68^\circ$, find the magnitude of $\hat{AEB}$ based on the given information.

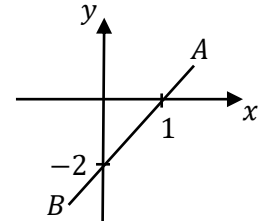


- 8) If the value of an imported item after paying 20% of its value as custom duty, is 14 400 rupees, find the value of the item before the custom duty is paid.

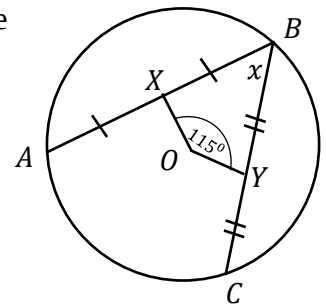
- 9) The diagram shows a sector of a circle with radius 21cm and central angle 60° lying inside a square. Find the perimeter of the shaded part.



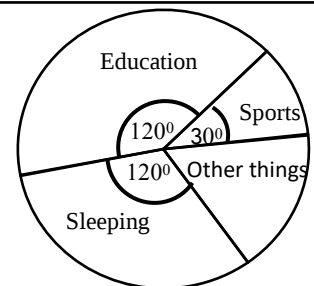
- 10) Find the equation of the straight line AB .



- 11) The diagram shows a circle with centre O . AB and BC are two chords of the circle. If $\angle XOY = 115^\circ$, find the value of x based on the information given.



- 12) The following pie chart shows how Metuka spends the 24 hours on a week day. Accordingly, how much time does Methuka spend for sports on a week day.



- 13) A container in the shape of a right circular cone of base area 20cm^2 and height 12cm is completely filled with water. When all the water in this container is poured into a right circular cylindrical container of base area 20cm^2 , to what height of that container will the water be filled. (The volume of a cone is $\frac{1}{3}\pi r^2 h$ and the volume of a cylinder is $\pi r^2 h$)

- 14) Factorize: $a^2 + 4ab - 5b^2$

- 15) In a triangular arrangement of cans of salmon, there is one can of salmon in the top row. If there are 6 rows in total, how many cans of salmon are in the bottom row?

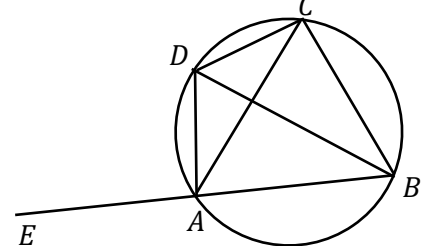
- 16) The angle of elevation of top of a pillar which is observed 20m away from foot of the pillar on the same horizontal level ground is 35° . Represent this information in a sketch. (Disregard the height of the observer)

17) Solve: $\frac{2}{3x} - \frac{1}{4x} = \frac{5}{12}$

- 18) There are toffees of the same size and shape, but different brand in a bag. If Saman draws a toffee randomly from the bag, find the probability of getting a coffee flavored toffee of brand A.

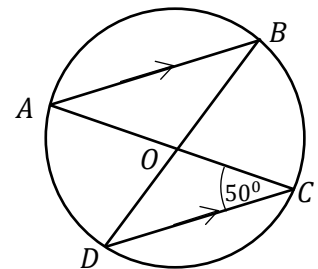
	Coffee flavored	Orange flavored
Toffee A	4	2
Toffee B	3	1

- 19) The points A, B, C and D lie on the circle shown in the figure. If $\widehat{BDC} = 60^\circ$, find the value of $\widehat{EAC}$

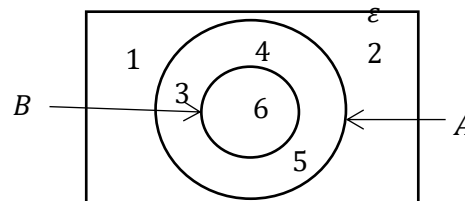


- 20) Express in the simplest form, the ratio between the volumes of two cylinders with the same base radius and heights of 8cm and 24cm.

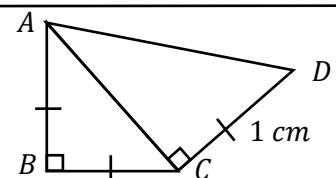
- 21) AB and DC are two chords of a circle with centre O. Here $AB \parallel DC$. If $\widehat{ACD} = 50^\circ$, find the value of $\widehat{BOC}$.



- 22) Write down the elements of $B' \cup A$

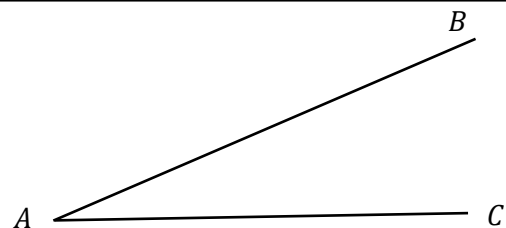


- 23) Find the length of AD.



24) Solve: $9p^2 - 4 = 0$

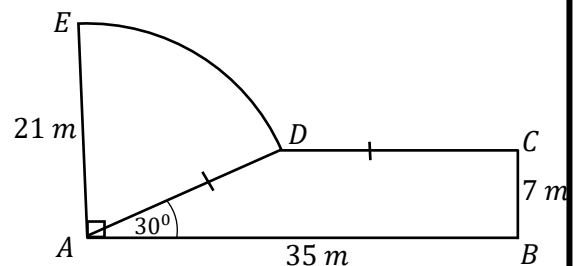
- 25) Two boundaries AB and AC of a land are shown in the figure. It is required to plant a coconut tree which is equidistance to two boundaries AB and AC and 4m away from the boundary AB. Sketch, using the knowledge of loci, the place where the tree can be planted.



Part B*Answer all questions on this paper itself*

- 1) Mr. Wasantha, who went to the city, spent $\frac{1}{4}$ of the money he brought with him to buy household necessities, $\frac{1}{5}$ to pay the electricity bill and $\frac{4}{11}$ of the remaining money to buy medicine.
- What fraction of the total amount of money was spent to buy household necessities and to pay electricity bill.
 - For what purposes has the same amount of money been spent?
 - If the remaining amount of money after all the above expenses is Rs. 3500, find the total amount of money that Wasantha had.
 - The government has announced that electricity bills will increase by 10% in the next month. Then, find the additional amount to be paid.

- 2) The figure shows a sketch of a flower bed consisting of a part $ABCD$ in the shape of a trapezium and a part ADE in the shape of a sector of a circle constructed in front of a star class hotel.
- Find area of the portion in the shape of a sector.



- It is required to erect electric lamp posts with a gap of $2m$ along the boundary of the flower bed. Find the number of lamp posts required for this.

iii. It is required to add a rectangular plot that is of area equal to the area of the flower bed, with AB as a side, outside the flower bed. Draw a sketch of this rectangle with its measurements in the above figure.

3) (a) An amount of 3600 rupees is paid as quarterly rates for a house of assessed annual value 240 000 rupees.

i. Calculate the annual rate percentage charged.

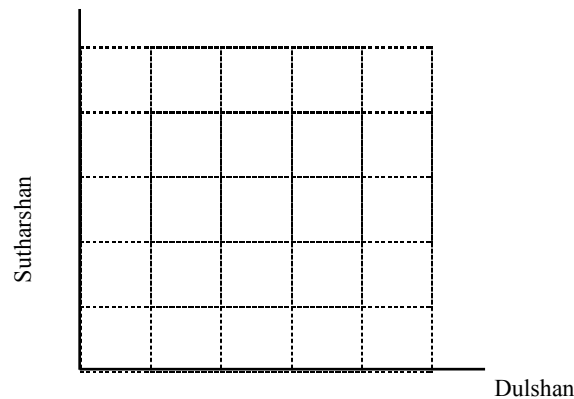
ii. In a new year, the quarterly rates payable on this property increased to 4 200 rupees but the annual rate percentage did not change. Find the annual assessed value of the house now.

(b) Food sufficient for 15 officers for 10 days has been stored at a certain training camp.

i. For how many days is the food sufficient for one officer.

ii. 8 days after the camp commenced, five officers were transferred to another camp. How many days will the remaining food be enough for the remaining officers,

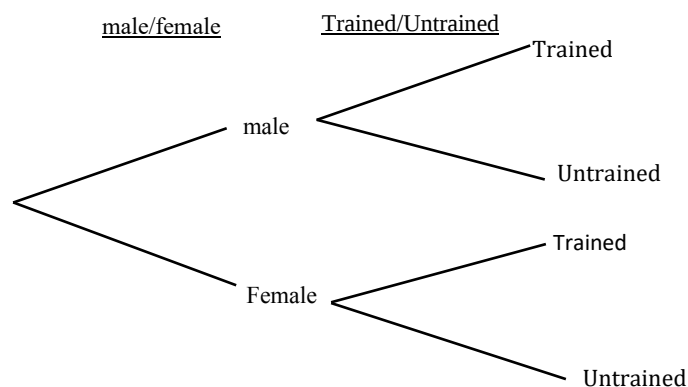
- 4) (a) i. Represent the sample space on the below grid showing the different ways in which Dulshan and Suhtarshn, two employees working in an institute, can take leave during the five days of a week.



- ii. Find the probability that Suhtarshn takes a leave on a day prior to the day that Dulshan takes a leave.

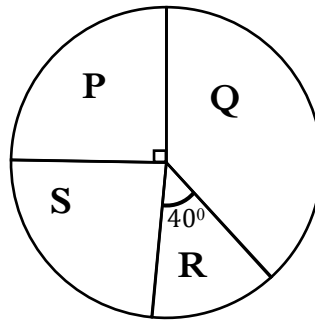
- (b) In this institution, there are five male workers and four female workers. Out of these workers, there are three males and two females who are trained workers. An incomplete tree diagram drawn to represent this information is shown in the figure.

- i. Complete the tree diagram by indicating the relevant probabilities.



- ii. Find the probability of a worker taken at random not being a trained worker.

- 5) The following pie chart represents quantity of each type of paint **P**, **Q**, **R** and **S** used by a fabric printing institute during a week



- i. Write the quantity of paint **R** used as a fraction of the total quantity of paint
- ii. If the quantity of paint **S** is $\frac{2}{3}$ of the quantity of paint **Q**, find the magnitude of the angle of the sector which represent paint **S**.
- iii. If the total amount of **P** and **Q** types paint was 798 litres, find the quantity of paint **Q** used
- iv. Find the total amount of paint used during that week



Royal College - Colombo 07
රාජකීය විද්‍යාලය - කොළඹ 07

32 E II

Grade 11 –First Term Test – April 2025
පළමු වන වාර පරීක්ෂණය – 2025 අප්‍රේල් - 11 ශ්‍රේණිය

Mathematics - II
ගණිතය - II

Time : 3 hours
කාලය : පැය 3

Instructions:

- Answer 10 questions selecting **five** questions from **part A** and **five** questions from **part B**.
- Write the **relevant steps** and the **correct units** in answering the questions.
- Each question carries **10** marks.
- The volume of a right circular cone of base radius r and height h is $\frac{1}{3}\pi r^2 h$
- The volume of a sphere of radius r is $\frac{4}{3}\pi r^3$

Part - A

Answer **five** questions only.

- 1) Indra Company imports cars from Japan and sells them in this country. A custom duty of 160% has to be paid when a modern car worth 2 500 000 rupees is imported to the country.

When selling this car, Indra company marks its price keeping a profit of 30%. If the payment is done outright, a discount of 5% is offered to the customer. Find the amount to be paid by the customer for the car on outright purchase.

- 2) An incomplete table of values prepared to draw the quadratic function $y = 6 - x^2$ is given below.

x	-3	-2	-1	0	1	2	3
y	-3	2	5	...	5	2	-3

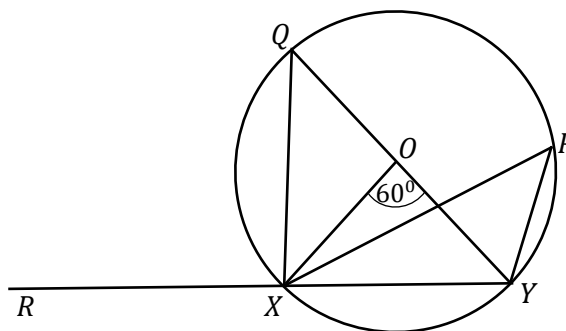
- a) i) Find the value of y when $x = 0$
 ii) Using the standard system of axis and a suitable scale, draw the graph of the above function on a graph paper.
- b) Using the graph,
 i) Write the maximum value of the function.
 ii) Write the interval of values of x for which $y \geq 5$.
 iii) Find roots of the equation $6 - x^2 = 0$
 iv) Find the interval value of x for which function is increasing positively.



- 3) A quantity of 3.6 m^2 of fabric is used completely to sew 10 rectangular flags of equal measurements. If the length of a flag is 50 cm greater than its breadth, by taking the breadth of a flag as $x \text{ cm}$, construct a quadratic equation, solve the equation and find the length and breadth of a flag. When sewing 10 flags as above, if a fabric type of 80 cm wide is chosen, find the number of meters of fabric that need to be purchased.
- 4) (a) Among the flower plants available at a certain nursery, three red rose plants and two white rose plants can be purchased for 3000 rupees. Furthermore, the cost of a red rose plant and three white rose plants is 2050 rupees. Taking the cost of red rose plant as x rupee and the cost of white rose plant as y rupee, construct a pair of simultaneous equations and by solving them, find the cost of each plant separately.
- (b) If $\frac{m}{n-m} = \frac{2}{3}$, find the value of $\frac{m}{n}$
- 5) An observer from the top of a light post at point **A**, observes a point **P** located on the same level ground at a distance of 20m from the foot of the light post with an angle of depression of 30° . When observed from point **A**, the angle of elevation of top of a mango tree which is located at a distance of 10m from the point **P**, opposite the light post is 20° . Represent above information on a suitable scale diagram. Find the height of the mango tree to the nearest first decimal place and find the angle of elevation of top of the mango tree from the foot of the light post.
- 6) The following frequency distribution gives the lengths of pieces of fabric wasted by a garment factory, measured to the nearest centimetre.
- | | | | | | | |
|-----------------------|-------|-------|-------|-------|-------|-------|
| Length of a piece(cm) | 50-52 | 53-55 | 56-58 | 59-61 | 62-64 | 65-67 |
| Number of pieces | 8 | 13 | 29 | 34 | 10 | 6 |
- What is the model class of this distribution
 - By taking the mid value of the model class as the assumed mean, find the mean length of a wasted cut piece.
 - If 50 pieces of fabric are wasted per day, show that total length of fabric wasted per month do not exceed 975 m .

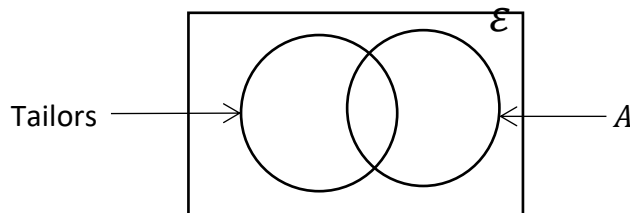
Part - BAnswer **five** questions only

- 7) In an arithmetic progression, n^{th} term is given by $3(2n - 1) + 2$.
- Write down the first three terms of this progression.
 - Find the common difference of it.
 - Show that the sum of first n^{th} term of this sequence is represented by $n(3n + 2)$.
 - Find the number of terms that should be added to get the sum of 1240 in that sequence using the formula obtained in (iii)
- 8) Use only a straight edge with *cm/mm* scale and a pair of compasses for the following constructions. Draw the construction lines clearly.
- Construct the triangle PQR such that $PQ = 6 \text{ cm}$, $\angle QPR = 60^\circ$ and $PR = 5.5 \text{ cm}$
 - Mark a point S on the line PQ produced such that $QS = 3 \text{ cm}$.
 - Construct a straight-line segment which is parallel to PR , passing through the point S .
 - Mark a point T which is at an equal distance from PS and PR , on the constructed parallel line
 - Join the lines RT , RS and PT , name a pair of triangles which are equal in area. Write the geometric theorem used for this.
- 9) (a) Write the theorem related to the angle subtended at the centre by an arc of a circle and the angle subtended on the remaining part of the circle by the same arc and prove it.
- (b) In the given figure, the points X , Y , P and Q lie on the circle with centre O . The side YX is produced to R . $\angle XOY = 60^\circ$.

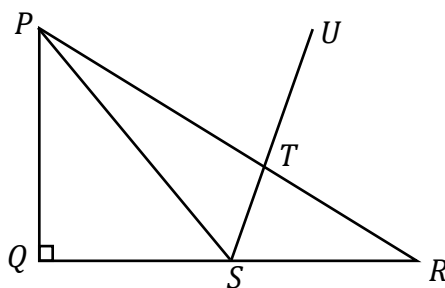


- According to the diagram, name an equilateral triangle, an isosceles triangle and a right-angled triangle.
- Based on the given information, find the magnitude of the following angles
 $\angle XQY$, $\angle XPY$, $\angle OXY$, $\angle OXQ$, $\angle QXR$.

- 10) Eight metal spheres each of diameter d are melted and a metal block in the shape of a right circular cone of base radius r is made without any wastage of metal.
- Express the volume of a sphere in terms of π and d .
 - If the height of the metal block in the shape of a cone is $3d$, show that $r = \frac{2d}{\sqrt{3}}$.
 - By taking $d = 10.2 \text{ cm}$, find the value of r to the nearest whole number using the logarithm table.
- 11) There are 100 members in a self-employed team. They have chosen tailoring and production of sweets as their jobs. (one person engages in only one job)
- The number of women who have chosen tailoring is 30.
 - The number of men in this group is 45.



- Copy the given Venn diagram in your answer script and include the given information and name the set A
 - How many women produce sweets.
 - Here, if the sum of the number of women engaged in sewing clothes and the number of men making sweets is 53, find the number of men making sweets.
 - Shade the region that represent the set of men sewing cloths in the Venn diagram.
- 12) In the right-angled triangle PQR shown in the figure, the angle bisector of $\hat{Q}PR$ meets the side QR at S. The foot of the perpendicular drawn from S to PR is T and the side ST is produced to U such that $ST = TU$.



- Copy the figure onto your answer script include the above information in it.
- Prove that $PQS\Delta \equiv PST\Delta$.
- Join QT and write down the relationship between $\hat{SQT}$ and $\hat{STQ}$. Give reasons.
- If $PU = SR$, Prove that PURS is a parallelogram.
