



Negombo Educational Zone

Second Term Evaluation - 2024

Mathematics



Name/ Index No. _____

Grade - 10

Paper II

Time - 3 hours

- Answer 10 questions by selecting 5 questions from part A and another 5 questions from Part B.
- Each question carries 10 marks. Total mark for the paper is 100.

2024-09

Part A

- 1) a) The way of calculating the income tax in a certain year by the Inland Revenue department is given below.

Annual income	Tax percentage
First Rs. 500000	Tax free
Next Rs. 500000	6%
Next Rs. 500000	8%
Next Rs. 500000	10%

- If the annual income of a particular businessman is Rs.1,800,000, find the amount of taxable income.
- Calculate the amount of income tax that he should pay for that year.

- b) The quarterly rates for a shop within the administrative domain of a certain urban council is Rs. 600. If the annual rate is 8%, find the annual assessed value of the shop.

- 2) An incomplete table to draw the graph of the function $y = 5 - x^2$ is given below.

x	-3	-2	-1	0	1	2	3
y	-4	1		5	4		-4

- Find the value of y when $x = -1$ and $x = 2$.
- By taking 10 small divisions as one unit along both the x -axis and the y -axis, draw the graph in a graph paper.
- Write the equation of the axis of symmetry.
- Write the co-ordinates of the turning point.
- Write range of x values where the function decreases positively.

- 3) Information on the amount of banana sold by a Certain vendor is given below.

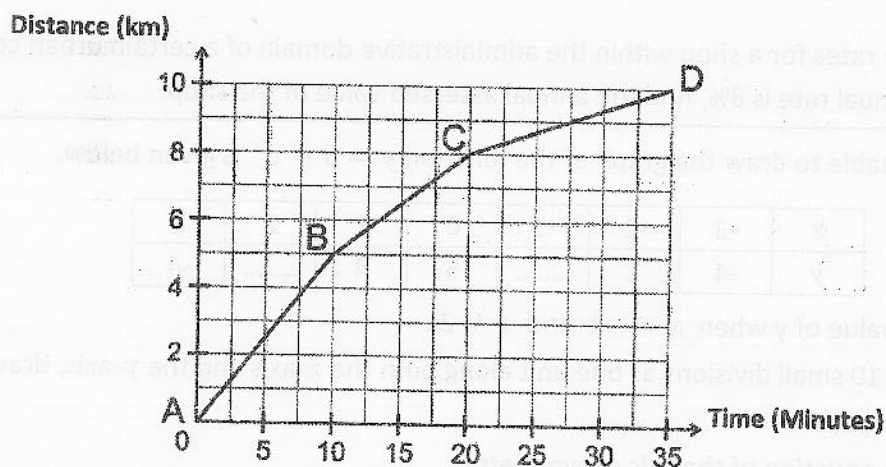
Number of bananas that hold in $1kg(x)$	Number of Kilograms (f)	fx
10	4	
11	6	
12	9	
13	10	
14	11	
15	5	
16	3	
17	2	

- i. Find the mode.
- ii. Complete the column fx .
- iii. Find the mean of the number of bananas that hold in one kilogram to the nearest whole number.
- iv. What will be the mass of 265 bananas in the above lot to the nearest kilogram.

4) The breadth of a rectangle is 3cm less than the length. The area of it is 28cm^2 . By taking the length as x , build a quadratic equation. Hence solve it and find the length and the breadth.

- 5) a) The length, breadth and the height of a cuboidal shaped tank is 6m , 5m and 2m respectively.
- i. Find the capacity of the tank in litres.
 - ii. Find the time taken to fill this tank completely in hours and minutes by using a pipe in which water flows at a uniform rate of 200l per minute.

b) The following is a distance – time graph which shows the motion of 'Hasaranga' who travels to his friend's place at D from his home A by a motor cycle.



- i. What is the distance from his home to the friend's place?
- ii. How long it took for him to travel to his friend's place?
- iii. Find the speed he travels in the 1st part of his journey AB , in kilometers per hour.

6) a) Solve. $\frac{1}{a-2} + \frac{2}{3(a-2)} = \frac{1}{3}$

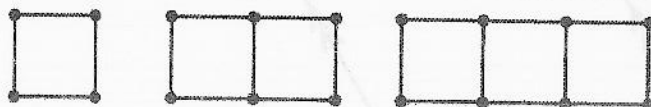
b) The price of an apple is one rupee more than the price of an orange. 3 apples and 4 oranges can be bought for Rs. 45.

- i. By taking the price of an apple as Rs. x and the price of an orange as Rs. y , build a pair of simultaneous equations.
- ii. By solving it, find the price of an apple and an orange separately.

Part B

- Answer only 5 questions.

7) The first 3 situations of a certain pattern which is made by pasting match sticks are given below.



- i. How many more match sticks are needed to prepare the second pattern than the first one.
- ii. Find the number of match sticks used to prepare each situation separately.
- iii. Find the number of match sticks needed to prepare the n^{th} pattern.
- iv. How many match sticks are needed to prepare the 9th situation?
- v. Which situation can be made by using 91 match sticks?

8) Carry out the following construction by using only the straight edge with the scale cm/mm and the compass and showing the construction lines clearly.

- i. Construct the triangle ABC where $AB = 7\text{cm}$, $\hat{BAC} = 60^\circ$ and $\hat{ABC} = 30^\circ$.
- ii. Construct the perpendicular bisector of AB .
- iii. Construct the circle with the diameter AB and name the centre as O .
- iv. Join CO and produce till it meets the circle at D .
- v. Measure the radius of the circle and write.

9) i. Find the value of $\log_2 4 + \log_2 8$.

ii. Solve; $\lg x - \lg 3 = \lg 2 + \lg 5$

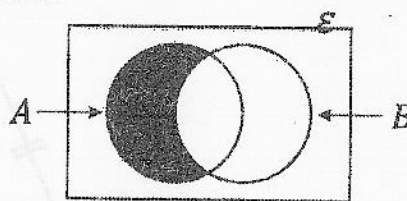
iii. By using the logarithmic tables find the value of $\frac{148.5 \times 3.684}{25.72}$

10) a) Ages of a group of students who participated in a certain survey is represented in the Venn diagram given below. The sets ε , A and B are as follows.

$\varepsilon = \{\text{Students who participated for the survey}\}$

$A = \{\text{Students who are above 15 years}\}$

$B = \{\text{Boys}\}$

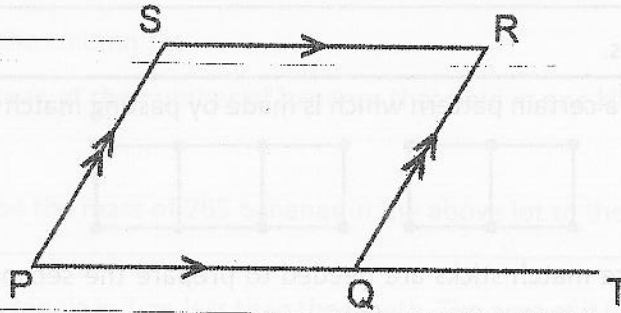


- i. Describe the students represented in the shaded region in words.
- ii. Write it in set notation.

b) The number of children in a certain sports camp is 100. Among them 60 are girls and 32 like to swim. The number of girls who like to swim is 20.

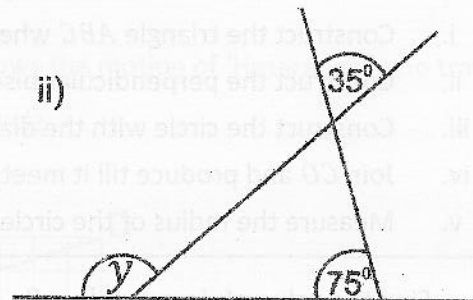
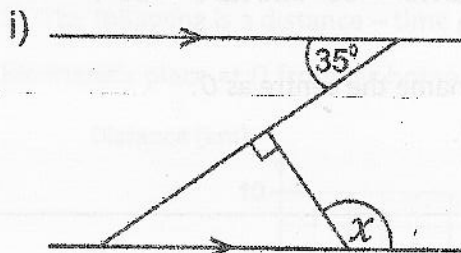
- i. Represent the above information in a Venn diagram.
- ii. How many boys like to swim?
- iii. Shade the region which represents the students who do not like to swim.
- iv. Find the number of girls who like to swim.

- 11) The side PQ in the rhombus $PQRS$ is produced to T . The angle bisector of RQT and the produced SR meets at O .

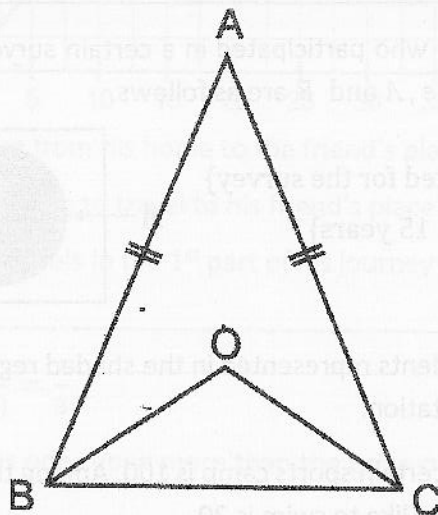


- Copy the figure on to your answer script and mark the above data.
- Show that $PQOR$ is a parallelogram.
- Show that $QR = RO$.
- If the lines PO and QR intersect at B , Show that $PQ = 2BQ$.

- 12) a) Find the magnitudes of the angles x and y .



- b) In the figure given, $AB = AC$. The angle bisectors of $\hat{ABC}$ and $\hat{ACB}$ meet at O . Prove that the triangle BOC is an isosceles triangle.



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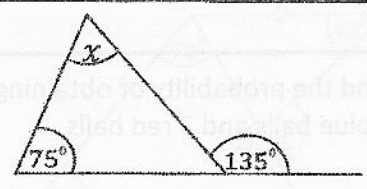
Grade - 10	Paper I	Part A	Time - 2 hours
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- Answer all the questions on this paper itself.

1) How much Tharushi should pay as the interest for a loan of Rs. 5000, at a monthly interest rate of 4%?

2) Factorise $3x^2 - 75$

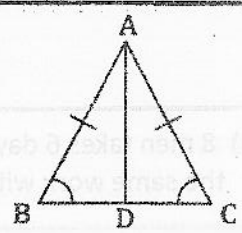
3) Find the value of x



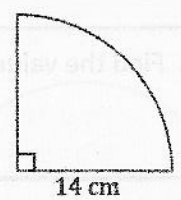
4) Find the Least Common Multiple (L.C.M) of $12x$, $6x^2$ and $20xy^2$

5) Find the first approximation of $\sqrt{12}$.

6) Write the other pair of elements that should be equal to become the triangles congruent under the case of congruency of S.A.S.



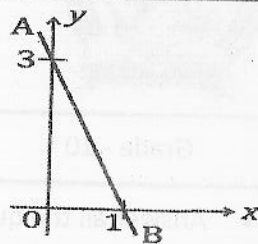
7) Calculate the area of the sector given.



8) Find the factors of $x^2 + 3x - 28$.

9) $A = \{2, 3, 5, 7\}$; Express this set in set builder method. (Set generation method)

10) Find the gradient and the intercept of the straight line AB .

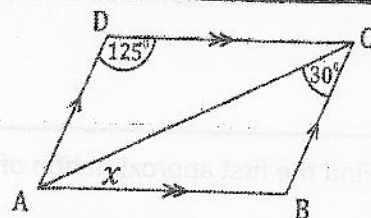


11) $5a + 3b = 12$; Without solving the simultaneous equations, find the value of $(a+b)$.
 $4a + 2b = 8$

12) $l = a + (n - 1)d$; Make 'n' the subject.

13) Find the probability of obtaining a red ball when a ball is taken randomly from a vessel which contains 5 blue balls and 3 red balls.

14) If $\widehat{ADC} = 125^\circ$ and $\widehat{ACB} = 30^\circ$ in the parallelogram $ABCD$, find the value of x .



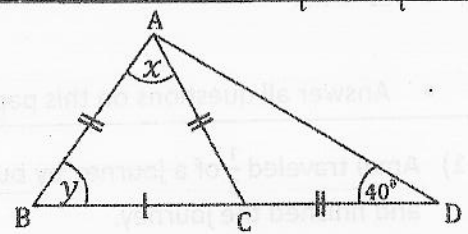
15) $(2x - 3)(3x + 1)$; Simplify.

16) 8 men takes 6 days to finish a certain piece of work. How many men are needed to allocate to finish the same work within 12 days?

17) Find the value of $\lg 25 + \lg 4$.

18) The annual assessed value of a certain house is Rs.35000. If the annual rates percentage is 8%, find the amount of annual rates.

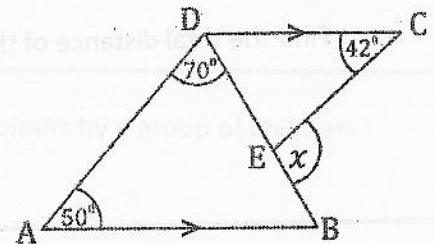
- 19) In the figure given, if $AB = AC$ and $\widehat{ADC} = 40^\circ$, find the value of x and y .



- 20) The marks obtained by 11 students for a certain evaluation is 17, 14, 15, 12, 16, 17, 18, 19, 20, 19, 12. Find the median of the marks.

- 21) Find the actual length represented by 6cm, in a map which is drawn to a scale 1: 50000.

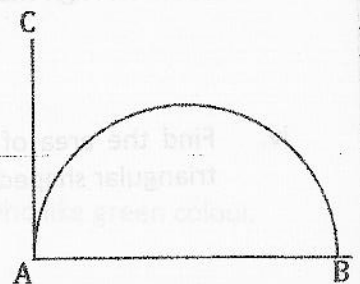
- 22) According to the information given, find the value of x .



- 23) Write 2 special properties in a rhombus which are not present in a parallelogram.

- 24) Find the distance travelled by a vehicle within $2\frac{1}{2}$ hours if it travels with a speed of 120km in an hour.

- 25) By using a rough sketch of the relevant constructions, find and mark the location of a point which travels equidistant to AB and AC and lies on the semi-circle.



Part B

- Answer all questions on this paper itself.

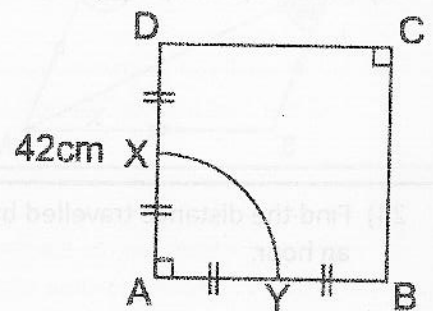
1) Amal traveled $\frac{1}{2}$ of a journey by bus and $\frac{2}{3}$ of the remaining by bicycle and the remaining 6km on foot and finished the journey.

- i. What fraction of the whole journey was traveled by bicycle?
- ii. What fraction of the whole journey was traveled by the bus and the bicycle?
- iii. What fraction of the whole journey was traveled on foot?
- iv. Find the total distance of the journey.

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2) $ABCD$ is a square shaped piece of cloth. The length of one side of it is 42cm.

- i. Find the area of $ABCD$.
- ii. If the sector AXY is cut from that piece of cloth, find the perimeter of the sector.
- iii. It is needed to cut a right angled triangular shaped portion with an area of 210cm^2 with the boundaries BC and CD from the above piece of cloth. CD should be one side of the triangle. Draw a rough sketch of the triangle with the relevant measurements, in the above figure.
- iv. Find the area of the piece of cloth remaining after cutting the sector and the right angled triangular shaped portion.



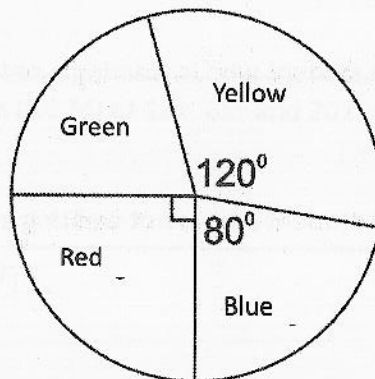
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3) 12 men can finish a certain piece of work within 15 days.

- i. Find the number of man days needed to finish the work?
- ii. After 5 days 2 men took leave. How many more days are needed to finish the work by the remaining men?
- iii. If the daily wage of a labourer is Rs. 1500, find the ratio between the amount earned by a man who did not take leave and a man who took leave.

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4) The following pie chart represents the preference for different colours by a group of children.



- i. Express the number of children who like blue colour as a fraction of the total number of children.
- ii. If 16 like blue colour, how many children were there in the group?
- iii. Find the angle at the center which represents the number of students who like green colour.

iv. How many more children like the yellow colour than the red colour?

v. 4 students change their preference for red colour to blue colour. Then what is the relationship between the number of children who like red colour and the number of children who like green colour?

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5) a) Among the 9 students who participate in a tour, 5 are wearing hats, 3 are wearing wrist watches and one is wearing a red colour band. By taking the ones who are wearing hats as A_1, A_2, A_3, A_4, A_5 and the ones who are wearing wrist watches as B_1, B_2, B_3 and the one wearing a red band as C_1 ,

- Write the sample space(s) which include all the ones in the group.
- Find the probability of being a student who is wearing a hat.
- Find the probability of being a student who is wearing a red band or a wrist watch.
- Find the probability of being a student who is not wearing a wrist watch and a hat, but only wearing a red band.

b) $\varepsilon = \{\text{Whole numbers between 10 and 25}\}$

$A = \{\text{Prime numbers between 10 and 25}\}$

$B = \{\text{Triangular numbers between 10 and 25}\}$

- List out the elements of ε , A and B .
- List out the elements of $(A \cap B)$ and $(A \cup B)$.
- Which type of a set is $(A \cap B)$?

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