

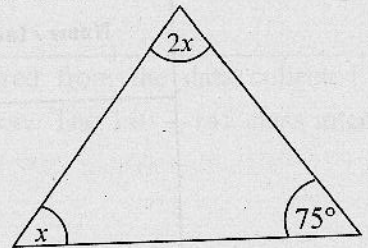
## Part A

Answer all the questions on this paper itself.

01. 10 machines can produce 300 goods in 6 hours. How many hours will it take for 15 machines to produce same quantity of goods?

02. Find the factors of  $25 - 4x^2$ .

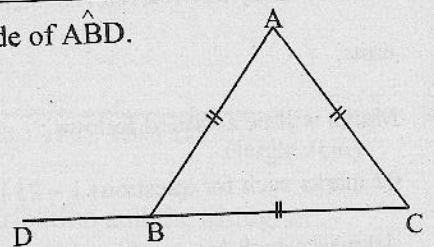
03. According to the information given in the figure, find the value of  $x$ .



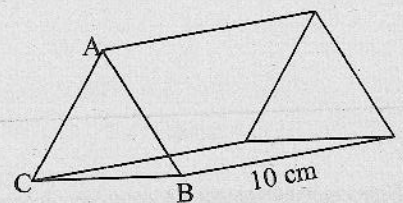
04. A right circular cylinder with the radius of the base 7 cm can be filled completely using  $770 \text{ cm}^3$  of water. Find the height of the cylinder. (Volume of a cylinder with the radius  $r$  and the height  $h$  is  $\pi r^2 h$ . Take  $\pi = \frac{22}{7}$ )

05. Find the least common multiple of the two algebraic expressions  $2a^2$  and  $4b$ .

06. In the figure,  $ABC$  is an equilateral triangle. Find the magnitude of  $\hat{ABD}$ .

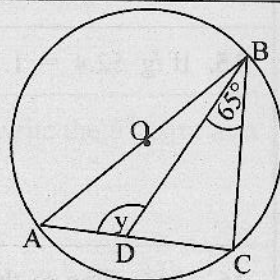


07. In the given prism, area of the cross section  $ABC$  is  $24 \text{ cm}^2$ . Find the volume of it.

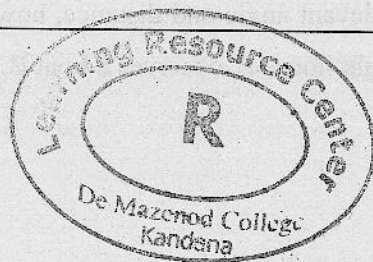


08. A person borrowed Rs. 40 000 at an annual simple interest of 5%. After how long will he have to pay half of the amount he borrowed as the interest?

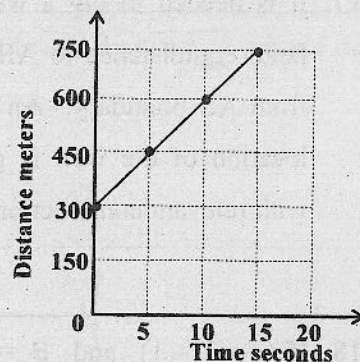
09. Diameter of the given figure is AB. According to the given information, find the value of  $y$ .



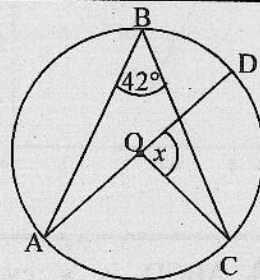
10. Solve.  $\frac{4}{x} + 1 = 3$



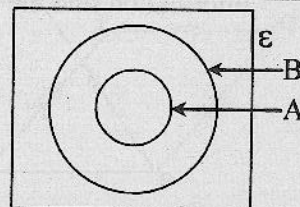
11. The distance time graph shown in the figure represents the motion of a motor vehicle which is travelling at a uniform speed in an express way. Find the speed of it.



12. O is the center of the given circle. Find the value of  $x$ .



13. Shade the region  $A \cap B$  in the given Venn diagram.



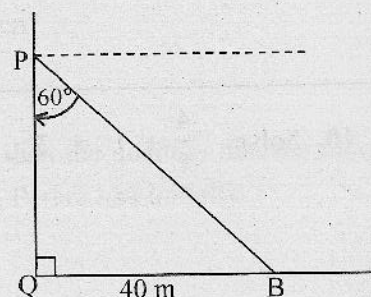


14. Fill in the blanks using suitable words.

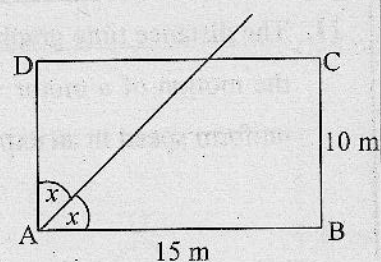
- When two sides are equal in a triangle, the ..... to the equal sides are equal.
- The ..... of a parallelogram is bisected by its diagonals.

15. If  $\lg 52.4 = 1.7193$ , Express 5.24 as a power of 10.

16. According to the information given in the sketch explain using relevant angle and distance, how a person who is at the top of a light house P, observes a boat B.

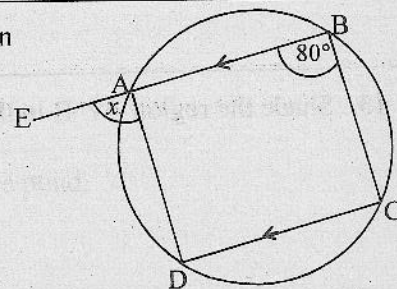


17. It is needed to dig a well inside ABCD rectangular shaped land, equidistance to AB and AD boundaries and 8 m away from AB boundary. An incomplete sketch drawn to find the location of the well is given below. Complete the diagram with relevant construction lines.



18. If  $A = \begin{pmatrix} 2 & -1 \end{pmatrix}$  and  $B = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$  find  $AB$ .

19. ABCD is a cyclic quadrilateral. According to the given information find the value of  $x$ .



20. Sample space of tossing a coin and rolling a die at the same time is shown in the grid. Represent the event 'obtaining a prime number in the die, on the grid and write the probability of it.

coin	die					
T	x	x	x	x	x	x
H	x	x	x	x	x	x
	1	2	3	4	5	6

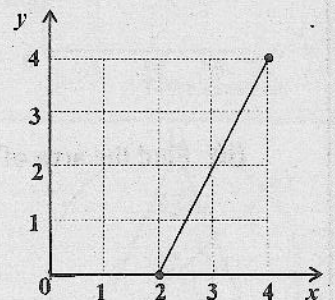
21. In the geometric progression with the first term 16 and the common ratio 2, write the 6<sup>th</sup> term as a power of 2.

22. Write the largest integer which satisfy the inequality  $1 + 2x \leq 0$ .

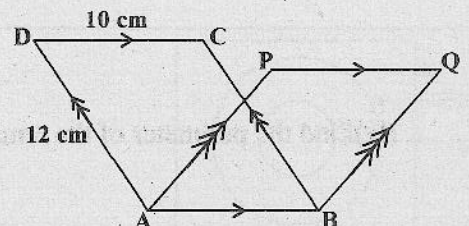
23. In the given frequency distribution draw a  $\bigcirc$  around the first quartile and draw a  $\square$  around the third quartile.

3 , 4 , 6 , 6 , 8 , 9 , 10 , 10 , 12 , 14 , 15

24. Find the gradient of the straight line given in the Cartesian plane.



25. Using the information given in the figure, find PQ length.



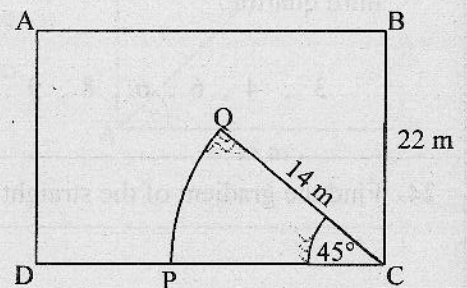


## Part B

Answer all the questions on this paper itself.

01. Mr. Perera decided to give  $\frac{1}{3}$  of his land to his wife and divide the remaining equally among his three children. But before that he had to sell  $\frac{1}{10}$  of the land due to a financial issue. The remaining amount is divided according to his previous decision.
- (i) What fraction of the land is remaining after selling  $\frac{1}{10}$  of the land?
- (ii) What fraction of the whole land is given to the wife?
- (iii) What fraction of the whole land was remained for three children?
- (iv) The quantity of land received by a child was 40 perches less than the quantity that the father decided to give initially. What is the total quantity of land Mr. Perera had initially?

02. Figure shows a ABCD rectangular shaped garden with the sector shaped pond where the angle of the sector at the center  $45^\circ$ .



- (i) Find PQ arc length.
- (ii) Find the area of the pond PQC.
- (iii) If the area of the remaining portion of land is 43 times larger than the area of the pond, show that the length of the rectangle is 7 times of its breadth.
- (iv) Find the perimeter of the remaining portion of land except the pond.

03. (a) A table with the information on how the income taxes are calculated, which was implemented in 2013 is given below.

Annual Income	Tax Percentage
Initial Rs. 500 000	Tax free
Next Rs. 500 000	4%
Next Rs. 500 000	8%
Next Rs. 500 000	12%

- Annual income of four companies A , B , C and D are given below.  
 A - Rs. 550 000                      B - Rs. 540 000  
 C - Rs. 460 000                      D - Rs. 1 500 000
- (i) According to the given information select and write all the companies in which the government can impose tax.
- (ii) Calculate the income tax company D has to pay.
- (iii) Company E pays Rs. 96 000 as annual income tax. Calculate the annual income of E.
- (b) The import value of a refrigerator is Rs. 60 000. If the percentage of duty charged for it is 20%, what is the value of the refrigerator after paying the duty?

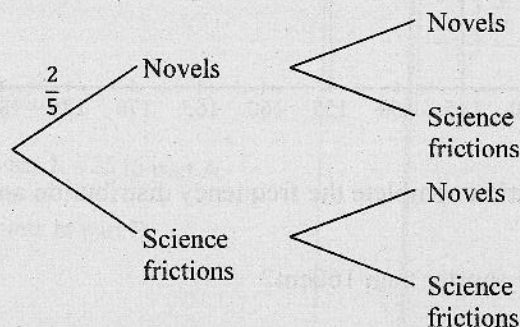
04. (a) Shamen and Suresh bought some books from a certain book exhibition.

Type of books	Suresh	Shamen
Novels	2	3
Science frictions	3	1

Shamen borrowed a randomly selected book from Suresh and put it into his pile of books which he bought and randomly select a book to read from it.

- (i) According to the above event, complete the give tree diagram with relevant probabilities

**Book borrowed from Suresh      Book selected to read**



- (ii) Find the probability that Shamen reads the same type of book which is borrowed from Suresh.



(b) There are 3 blue pens and 2 black pens in Nethmi's pencil box. She randomly select a pen from it and gave it to Aruni to write notes. Then she randomly select another pen for herself.

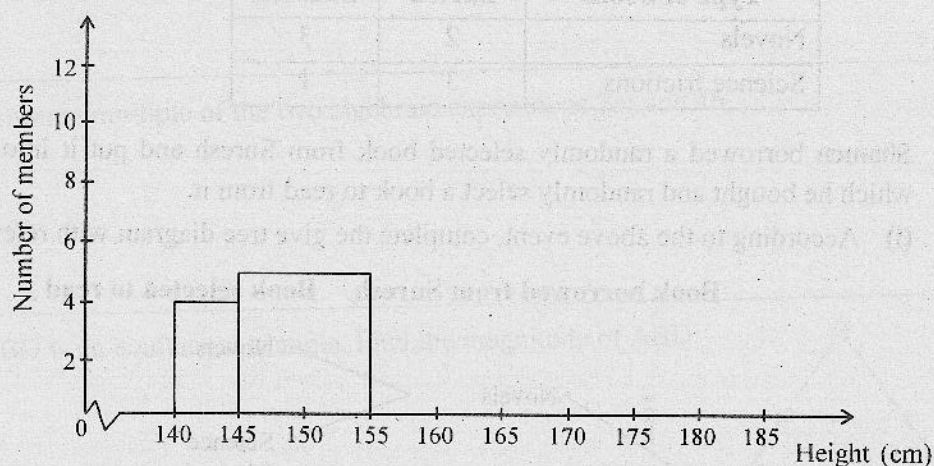
- (i) Represent the sample space of selecting a pen in the given grid using x. Blue pens are marked in  $N_1, N_2, N_3$  and black pens are marked in  $K_1, K_2$ .

Nethmi's pen	$K_2$					
	$K_1$					
	$N_3$					
	$N_2$					
	$N_1$					
		$N_1$	$N_2$	$N_3$	$K_1$	$K_2$
		Aruni's pen				

- (ii) Circle the event both of them are using same colour of pens in the given grid and write the relevant probability.

05. An incomplete frequency distribution and a histogram prepared from the data collected by measuring the heights of members in a sports club is given below. The 140 – 145 class interval represents the data greater than or equal to 140 and less than 145.

height (cm)	No of members
140 – 145	.....
145 – 155	.....
155 – 160	12
160 – 175	18
175 – 185	6



- (i) Using the given information complete the frequency distribution and the histogram.
- (ii) How many members are shorter than 160cm?
- (iii) Using the histogram draw the frequency polygon.

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 ஆண்டிறுதி மதிப்பீடு - 2019  
 Third Term Evaluation

ලේඛන  
 தரம் } 11  
 Grade

විෂය  
 பாடம் } Mathematics  
 Subject

පත්‍රය  
 வினாத்தாள் } II  
 Paper

කාලය  
 காலம் } 3 hours  
 Time

- ◆ Answer 10 questions selecting 5 questions from part A and five questions from part B.
- ◆ Each question carries 10 marks and this paper carries 100 marks.
- ◆ Volume of a cylinder with the radius  $r$  and the height  $h$  is  $\pi r^2 h$  and volume of a sphere with radius  $r$  is  $\frac{4}{3}\pi r^3$ .

Part A  
 Answer five questions only.

01.

Annual compound  
 interest rate of 15%

A

Annual dividend of Rs. 6 per  
 share with the market value  
 Rs. 50

B

Mr. Amarasena deposited Rs. 60 000 in the financial institute A and invested some amount to buy shares in the company B.

- (i) What is the interest received by Mr. Amarasena at the end of the year?
- (ii) What is the total amount received by Mr. Amarasena from A at the end of two years?
- (iii) If the annual dividend received by Mr. Amarasena from the company B is Rs. 6 000, how much did he invest in company B?
- (iv) After receiving the annual dividend in the second year, he sold all his shares when the market value is Rs. 60 per share. Find the total income he receives after two years.

02. An incomplete table of values prepared to draw the graph of the function  $y = 4 - (x - 1)^2$  is given below.

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

- (i) Obtain the value of  $y$  when  $x = 1$ .
- (ii) Using a suitable scale draw the graph of the function on a Cartesian plane.
- (iii) Describe the graph of the function in the range  $2 < x < 4$ .
- (iv) If the graph of the function can be express in the form  $y = (a + x)(b - x)$ , write the values of  $a$  and  $b$ .
- (v) Obtain the solution of the function  $x^2 = 2x + 3$  using the graph.



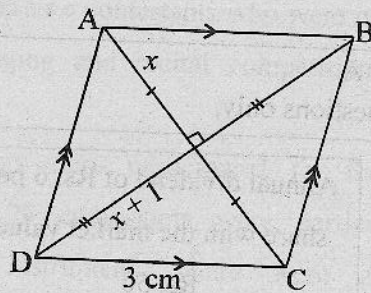
03. (a) In a certain vehicle park which is only for three wheelers and motor cars, the number of motor cars parked is one less than twice the number of three wheelers parked inside it. The total number of wheels of the vehicles parked inside the vehicle park is 73. (Ignore the spare wheel)

(i) By taking the number of three wheelers as  $a$  and number of cars as  $b$ , build up a pair of simultaneous equations.

(ii) By solving the pair of simultaneous equations find the total number of vehicles parked inside the car park.

(b) Find the maximum value of which satisfy the inequality  $4x + 5(2x - 1) \leq 79$

04. According to the information marked in ABCD rhombus, show that the value of  $x$  satisfy the quadratic equation  $x^2 + x - 4 = 0$  and find BD length to the nearest first decimal place. (Take  $\sqrt{17} = 4.12$ )



05. From the top B of a vertical light house AB, a boat C which is moving 10 m away from A can be observed at an angle of depression of  $68^\circ 42'$

(i) Draw the locations of A, B and C in a rough sketch and mark the given measurements in it.

(ii) Using trigonometric ratios calculate the height of AB light house.

(iii) 5 seconds after the initial observation, the boat is located at D which is situated along AC. If  $BD = 36.26$  m, calculate the angle of elevation of the top of the light house B from the boat to the nearest degree.

(iv) Find the distance traveled by the boat in 5 seconds.

06. A frequency distribution prepared from the data collected regarding the number of coconuts sold at 'Sahani' coconut selling center during a certain month is given below.

Number of coconuts	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39
Number of days	2	3	6	10	5	4

By taking a suitable assumed mean or using another method, find the mean number of coconuts sold in a day to the nearest whole number. If the profit gained by selling a coconut is Rs. 8, show that the profit gained by the vender within three months does not exceed Rs. 19 000.

## Part B

Answer five questions only.

07. (a) In a triangular shaped decoration which was prepared using multi colour electric bulbs, there are 109 bulbs in the first row. In every other row the number of bulbs in the next row is 4 less than the previous row. There is only one bulb in the last row.

(i) Find the number of rows of bulbs in this decoration.

(ii) Find the total number of bulbs in the decoration.

(b) Second term of a geometric progression is 6. The common ratio of it is a positive number and the sum of the third and the fourth terms is 36. Find the first term and the common ratio of it.

08. For the following constructions use only the straight edge with the scale mm/cm and the pair of compasses only. Show the construction lines clearly.

(i) Construct the triangle PQR where  $PQ = 8 \text{ cm}$ ,  $\hat{QPR} = 45^\circ$  and  $PR = 6 \text{ cm}$ .

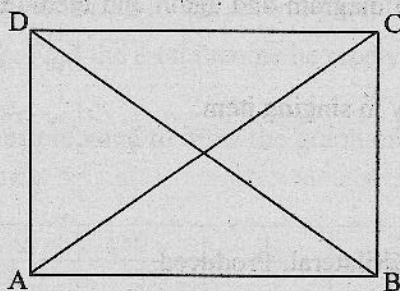
(ii) Construct the perpendicular bisector of PQ.

(iii) Name the mid point of PQ side as S and construct the circle which touches PQ at S and the center O lies on extended PR.

(iv) Construct another tangent to the above circle from P and name the point which it touches the circle as T.

(v) Join OT and find the value of  $\hat{POT}$ . Write the theorem that you used to find the value.

09. In the ABCD rectangle AC and BD diagonals are joined. Mid points of AB, BC, CD and DA are P, Q, R and S respectively.

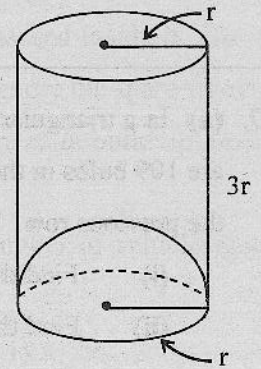


(i) Copy the diagram in your answer sheet and show that PQRS is a rhombus.

(ii) Show that Area of PQRS rhombus = Area of ABCD rectangle - 4 APS  $\Delta$



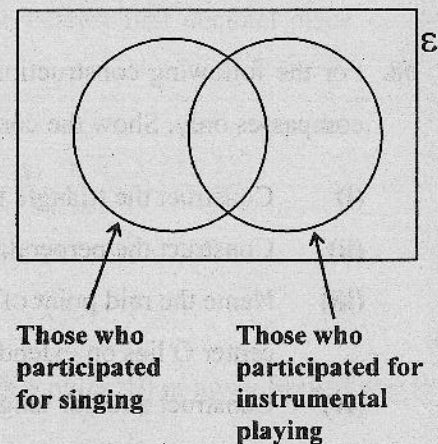
10. Figure shows a cylindrical glass container with the internal radius  $r$  and the height three times the radius of it. A solid metal hemisphere with the radius  $r$  is put inside the cylinder as shown in the figure and water is poured into the cylinder until it get filled completely. If the quantity of water needed to fill the container is  $99\text{ml}$ , show that  $r = \frac{3}{\sqrt{2}}$  and using logarithmic tables find the value of  $r$  to the nearest second decimal place.



(Take  $1\text{ml} = 1\text{cm}^3$  and  $\pi = \frac{22}{7}$ )

11. A Venn diagram drawn to represent the data on number of students and the reserve contestants who were participated for a certain singing and recital competition is given below.

★ 35 contestants were participated for the singing competition. 28 contestants were participated by playing an instrument. There were 2 reserve contestants. Total number of contestants participated are 50.



- Copy the Venn diagram in your answer sheet and complete it using given information.
- How many were participated for both items?
- Among the contestants who participated 21 have won the competition and 10 of them have won in both singing and instrumental playing. No contestant has won only instrumental playing. Copy the above Venn diagram and again and include the sub set winners in it and include the above data.
- Shade the region who won only in singing item.

12. In the figure, PQRS is a cyclic quadrilateral. Produced SR and PQ meets at T.  $PR = PS = RT$ . Show by giving reasons,

- $\widehat{PSR}$  is bisected by QS.
- $\triangle PQS \cong \triangle QRT$
- If  $\widehat{QTR} = 30^\circ$ , QS is a diameter.

