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 Department of Education - Western Province
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 மேல் மாகாணக் கல்வித் திணைக்களம்
 Department of Education - Western Province

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වර්ෂ අවසාන ඇගයීම
 ஆண்டுமுறுதி மதிப்பீடு - 2018
 Year End Evaluation

ශ්‍රේණිය } 11
 තරම } Grade

විෂය
 பாடம் } Mathematics
 විෂය
 Subject }

පත්‍රය
 வினாத்தாள் } I
 විෂය
 Paper }

කාලය } 02 Hours
 කාලය } Time

Name / Index No :

.....

Signature of invigilator

Important :

- ❖ This paper consist of 8 pages.
- ❖ Write your index number correctly in the appropriate place on page one and 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 write relevant steps and correct units.
- ❖ Marks will be awarded as follows:
 02 marks each for questions 1 - 25 in part A
 10 marks each for questions in part B

For marking examiner's use only

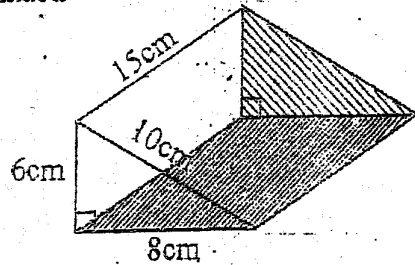
Question number		Marks
A	1 - 25	
B	1	
	2	
	3	
	4	
	5	
Total		
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Part - A

Answer all the questions on this paper itself.

- (01) The monthly telephone charges of a certain household is Rs. 2 400. If the VAT charges are 15%, calculate the VAT.

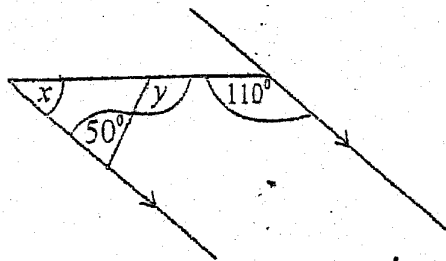
- (02) In the given right prism, draw the sketches of the shaded faces with relevant measurements.



- (03) Using the following information, find the value of $\sqrt{7}$ to the first approximation.
 $(2.5)^2 = 6.25$, $(2.6)^2 = 6.76$, $(2.7)^2 = 7.29$

- (04) Solve. $x(x-2) = 0$

- (05) According to the information given in the figure, find the value of x and y .



- (06) In a geometric progression, second, third and fourth terms are 12, 48 and 192 respectively. Find the common ratio and the first term.

(07) Simplify. $\frac{1}{x^2} - \frac{1}{2x^2}$

(08) A bus travels at a speed of 90 kilometers per hour. Find the distance it travels within a minute, in kilometers.

(09) Express in index form. $\log_3 81 = 4$

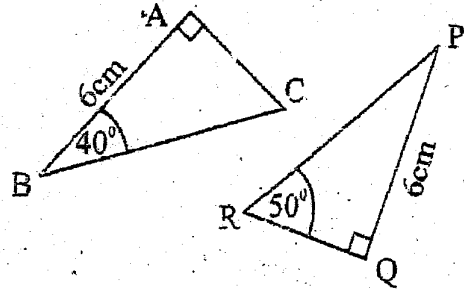
(10) Represent the set A in a Venn diagram.

$$A = \{x : x \in \mathbb{Z}, -2 \leq x < 3\}$$

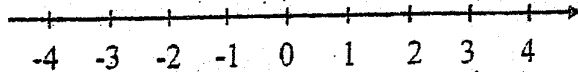
(11) When two identical coins are tossed simultaneously, find the probability that at least one coin shows head.

(12) Find the least common multiple. $3ab, 2b, a^2$

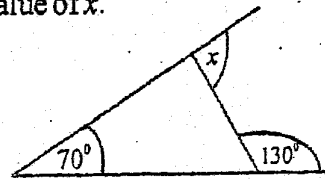
- (13) Are the two triangles ABC and PQR congruent? If so write the relevant case of congruency.



- (14) Solve the inequality $x - 1 \leq 2$ and represent the solution on the number line given below.

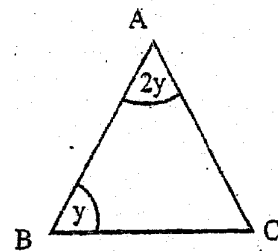


- (15) According to the information given in the figure, find the value of x .

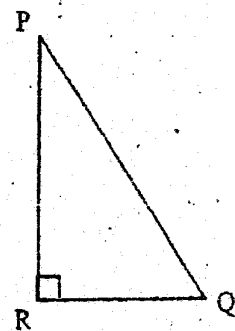


- (16) Given below are the first 8 data, when a group of 15 data is written in ascending order.
4, 7, 7, 8, 9, 9, 10, 11
Write the median and the first quartile of the group of data.

- (17) In the triangle ABC, $AB = AC$. Find the value of y .

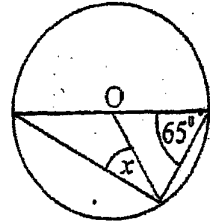


- (18) A man who is at the top (P) of a vertical building PR, observes a car (Q) which is 15m away from the foot the building, at an angle of depression of 60° . Mark the given information in the diagram with relevant measurements.

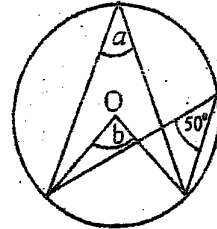


(19) $A = \begin{pmatrix} 2 & -1 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 0 \\ 2 & -1 \end{pmatrix}$. Obtain the product AB of the two matrices A and B .

(20) According to the information given in the circle with the center O , find the value of x .

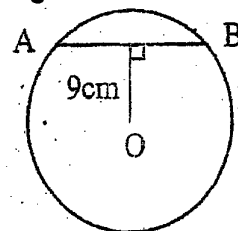


(21) According to the information given in the circle with the center O , find the values of a and b .

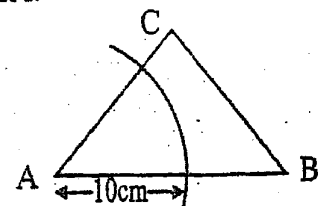


(22) Volume of a right circular cylinder is 1540cm^3 . If the height of it is 10cm , find the radius. (Volume of a cylinder with the radius r and the height h is $\pi r^2 h$.)

(23) The radius of the given circle with the centre O is 15cm . According to the given information, find the length of the chord AB .



(24) In the given diagram, draw a sketch of relevant construction lines to locate a point D , which is equidistant to the lines AB and AC and 10m away from A .



(25) Find the gradient of the straight line which passes through the points $(1, 2)$ and $(3, 6)$.

Part B

Answer all the questions on this paper itself.

(01). In a certain library, there are only Sinhala medium and English medium books. $\frac{1}{4}$ of the total number of books are Sinhala medium novels and $\frac{1}{5}$ of the total are Sinhala medium Science frictions.

(i) What fraction of the total number of books are Sinhala medium novels and Sinhala medium science frictions?

(ii) $\frac{7}{11}$ of the remaining books are English medium books. Express the number of English medium books as a fraction of total number of books.

(iii) What fraction of the total number of books are the difference between the number of Sinhala medium books and the number of English medium books?

(iv) If that amount is 1200, find the total number of books in the library.

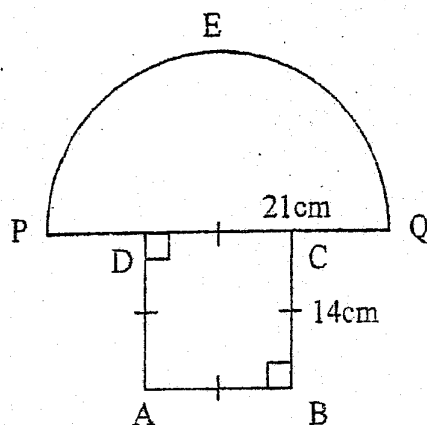
(02) Figure shows a logo prepared using a metal lamina. It consists of PEQ semi circle with the radius 21 cm and ABCD square with the length of a side 14cm.

(take $\pi = \frac{22}{7}$ for the following calculations)

(i) Find the arc length of the PEQ semi circle.

(ii) Find the perimeter of the logo.

(iii) Find the area of the logo.



(iv) If a rectangular shaped portion with the length of a side equal to PQ and with the area equals to the three times of the ABCD square, is fixed to the PQ side instead of the ABCD square. Draw a sketch of it with relevant measurements in the same figure.

(03) Ravindra loaned Rs. 4 000 000 at a compound interest rate of 12% and decided to import a car from that money.

(i) Find the interest to be paid at the end of the first year.

(ii) Find the interest to be paid at the end of the second year.

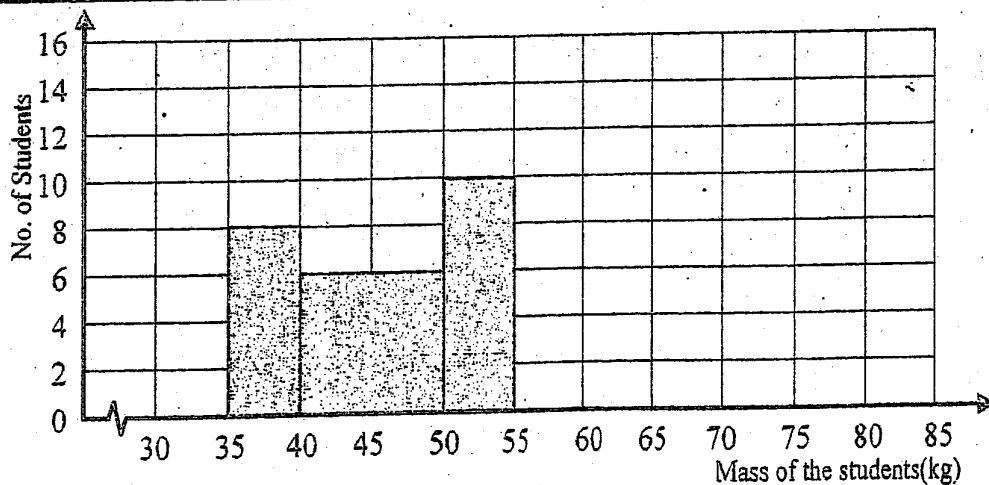
(iii) Find the total amount that Ravindra has to pay to settle the loan after two years.

(iv) When a car is imported 60% of its value has to be paid as customs duty. He decided to pay the duty and the import value using only the above loaned amount. Find the import value of the car that he can buy.

(04) An incomplete table of values and a histogram which represents the mass of grade 11 students in a certain school are given below.

(The interval (35 - 40) denotes the mass greater than or equal to 35kg and less than 40kg)

Mass of the students(kg)	35-40	40-50	50-55	55-60	60-75	75-80
No. of Students	11	15	4



(i) Fill in the blanks in the table using the histogram.

(ii) Complete the histogram using the table.

(iii) Draw the frequency polygon using the completed histogram.

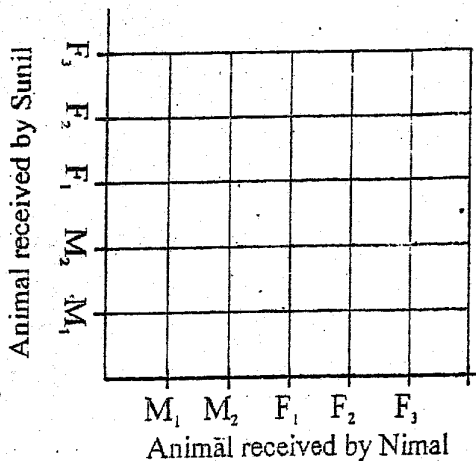
(iv) How many students are there in the class?

(v) Find the percentage of students who weighs 55kg or more.

(05) In a certain cattle farm, there are two male animals and three female animals. It is decided to give two randomly selected animals to Nimal and Sunil.

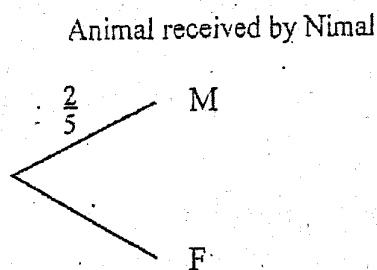
(i) Represent the relevant sample space of the event, selecting two animals randomly in the given grid.

(male animals are denoted by M and female animal are denoted by F)



(ii) Mark the event, 'one selected animal being a male and the other selected one being a female' in the grid and find its probability.

(iii) Complete the given tree diagram by marking the relevant probabilities, which is drawn to represent the animal received by Nimal.



(iv) Among the five animals in the cattle farm, only two female animals can provide milk. Extend the above tree diagram to represent the event that the animal received by Nimal can be able to provide milk or not and find the probability that the animal received by Nimal can be able to provide milk.

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ஆண்டிறுதி மதிப்பீடு - 2018
Year End Evaluation

ශ්‍රේණිය } 11 தரம் } 11 Grade } 11	විෂයය } பரம் } Subject } Mathematics	පත්‍රය வினாத்தாள் } II பாபர் }	පාලය } காலம் } 03 Hours Time }
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- ❖ Answer 10 questions selecting 05 questions from part A and 05 questions from part B.
- ❖ Each question carries 10 marks.
- ❖ Volume of a sphere with the radius r is $\frac{4}{3} \pi r^3$. Volume of a cylinder with the radius r and the height h is $\pi r^2 h$.

Part A
Answer 05 questions only.

(01) An incomplete table of values prepared to draw the graph of the function $y = (x + 1)(x - 3)$ is given below.

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

- (i) Find the value of y , when $x = 0$.
- (ii) Taking 10 small divisions along the x axis and the y axis as one unit as the scale, draw the graph of the above function in a graph paper.
- (iii) Write the range of values of x where $y > 0$.
- (iv) If the above function can be written in the form $y = x^2 + ax + b$, write the values of a and b .
- (v) Using the graph, find the roots of the equation $x^2 - 2x - 3 = 0$.

(02) Following table contains the information on 100 students of different age groups who came for an educational exhibition.

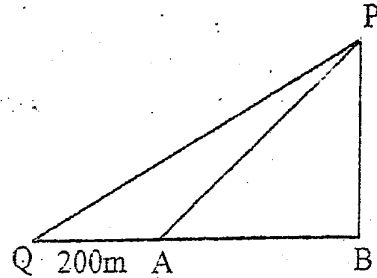
(The interval (6 - 8) denotes the interval of age which are greater than 6 years and less than or equal 8 years)

Age (years)	6 - 8	8 - 10	10 - 12	12 - 14	14 - 16	16 - 18
No of Students	10	12	25	20	18	15

- (i) To which age group does the most number of students belong?
- (ii) Using the assumed mean or other method, find the mean age of a student who came for the exhibition to the nearest whole number.
- (iii) A member of the organizing committee claims that more than 75% of students who came to the exhibition, are older than 10 years. Is that statement true? Give reasons.

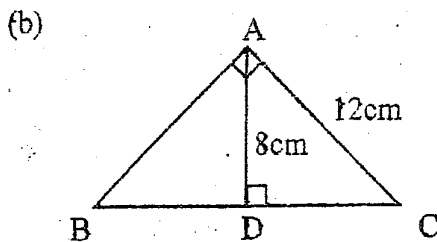
- (03) An investor who owned 4000 shares in a company which pays an annual dividend of Rs. 5 per share sold these shares at the market price of Rs. 40, after receiving the annual dividend income. He spent the dividend income and the money he received by selling the shares to buy shares at the market price of Rs. 25. From this investment he gained an annual dividend income which was Rs. 8 800 more than what he received from the previous investment. Find the annual dividend per share that the second company paid.

- (04) (a) Wimal who is standing at a point A in a river bank, observes a top of a tree P, which is situated at the other side of the river at an angle of elevation of 50° . The width of the river is AB. He observes the top of the tree (P) from a point Q which is 200m away from A; with an angle of elevation of 30° .



An incomplete sketch diagram drawn to represent the above data is shown in the figure. Using the scale 1:4000,

- Draw a scale diagram to represent the above information.
- Hence find the actual width (AB) of the river.

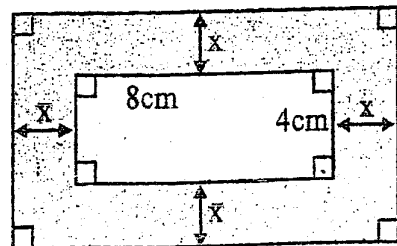


According to the information given in the figure, using the trigonometric ratios,

- Find the magnitude of \hat{ACD} .
 - Find the length of AB.
- (05) (a) The total amount of money Kamala and Janani have is equal to the three times of the amount of money Janani has. If Janani gives Rs. 50 to Kamala, Kamala owns four times the remaining amount on Janani's hand.
- By taking the amount of money Kamala has as x and the amount of money Janani has as y , build up a pair of simultaneous equations.
 - Solve the pair of simultaneous equations and find the amounts of money Kamala and Janani has separately.

- (b) Find the matrix M , such that $3M + 4 \begin{pmatrix} 2 & -1 \\ 3 & 0 \end{pmatrix} = M$

- (06) A metal lamina is prepared by removing a rectangular portion with the length 8cm and the breadth 4cm from a rectangular shaped lamina as shown in the figure. If the area of the removed portion is equal to the area of the remaining portion, find the value of x ; the distance between parallel edges. (Take $\sqrt{17} = 4.1$)



Part B
Answer five questions only.

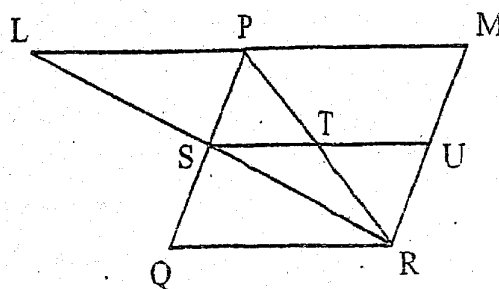
- (07) (a) n^{th} term of a progression is $T_n = 3n - 1$
- (i) Write the first three terms of the above progression and by giving reasons state what type of a progression is it.
 - (ii) Find the sum of the first 20 terms of it.
- (b) A worker who dig wells charges Rs. 1 500 to dig the first meter, Rs. 3 000 to dig the second meter, Rs. 6 000 to dig the third meter and so on. If he earned Rs. 46 500 by digging a certain well, write down the relevant formula of progressions which is needed to find the depth of the well. Using the formula find the depth of the well.

(08) Use only the straight edge with the scale cm/mm and the pair of compasses do the following constructions. Show the construction lines clearly.

- (i) Construct a circle with the centre O and the radius 4cm.
- (ii) Mark a point X on the circle and construct a tangent to the circle from X
- (iii) Mark the point Y on the tangent which is 6cm away from X and construct another tangent YZ to the circle from the point Y. Z is the tangent point.
- (iv) Construct the circle which passes through the points O, X, Y and Z.
- (v) Using your construction, write down the value of $\sqrt{13}$ to the nearest first decimal place.

(09) In the triangle PQR, mid points of the sides PQ and PR are S and T respectively. The produced ST line intersect the line drawn through R, parallel to QP at U. the line drawn through P, parallel to QR meets the produced RS line and the produced RU line at L and M respectively.

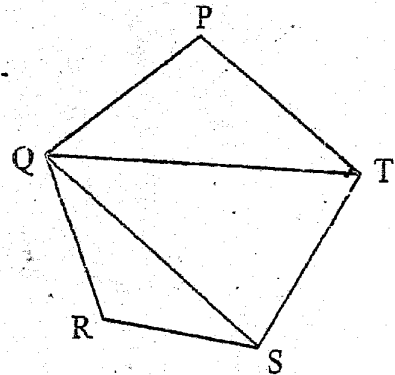
Copy the diagram in your answer sheet and mark the given data on it. Show that PSRU is a parallelogram and prove that the area of the triangle LMR is twice the area of the triangle PQR.



(10) In the PQRST pentagon shown in the figure, $PQ = QR$, $PT = RS$ and $\hat{TPQ} = \hat{QRS}$.

Mark the given information on the diagram.

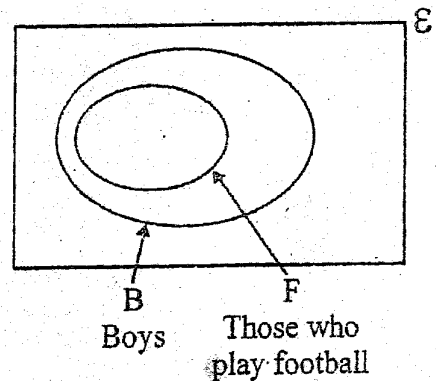
- (i) Show that $QT = QS$.
- (ii) Show that $\hat{PTS} = \hat{RST}$.
- (iii) X is the foot of the perpendicular drawn from Q to the side ST. QX is produced to Y, such that $QX = XY$. TY and YS are joined. Mark these information on the diagram and show that QTYS is a rhombus.



(11) A solid metal bar with the radius 9cm and the breadth 30cm is melted and without wasting any metal, spheres with the radius r is made. Show that $r = \left(\frac{3645}{32}\right)^{\frac{1}{3}}$ and using logarithmic tables find value of r .

(12) There are 40 students in a class. A Venn diagram drawn to represent the following information is given below.

- ◆ There are 15 girls.
- ◆ 16 play football.
- ◆ 5 boys who play football are prefects.



- (i) Copy the given Venn diagram in your answer sheet and draw the subset male prefects (P) on it. Represent the given information on the Venn diagram.
- (ii) Shade the region which represent the prefects who doesn't play football.
- (iii) Find the number of boys who doesn't play football.
- (iv) If $n(F \cup P) = 19$, find $n[(F \cup P)' \cap B]$.