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தென் மாகாணக் கல்வித் திணைக்களம் தென் மாகாணக் கல்வித் திணைக்களம்
Department of Education, Southern Province Department of Education, Southern Province

දෙවන වාර පරීක්ෂණය - 2024
இரண்டாம் தவணைப் பரீட்சை - 2024 / Second Term Test - 2024

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ශ්‍රේණිය
தரம்
Grade } **Grade 11**

MATHEMATICS I

කාලය
நேரம்
Time } **2 hours**

නම
பெயர்
Name

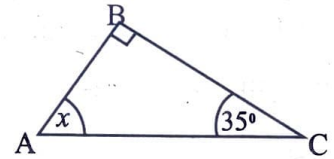
විභාග අංකය
சட்டிடலக்கம்
Index No.

- Answer all the questions in this paper itself.
- 2 marks for each correct answer in part A and 10 marks for each question in part B

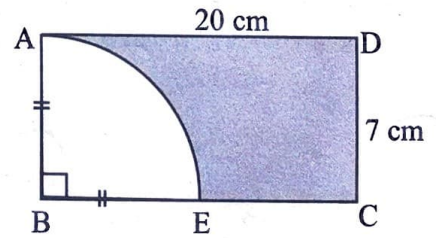
PART A

1. It is estimated that 40 man days are required to complete a certain task. How many man days of work are left after 9 men work for 3 days?
2. The least common multiple of 3 algebraic terms is $12a^3b^2$. Select and underline the correct algebraic terms that can be,
(i) $4a^2, 3ab^2, 12ab$ (ii) $2a^3, 3ab^2, 6ab$ (iii) $3a^2, 6a^2b^2, 4a^3$

3. Find the value of x by using the information given in the figure.

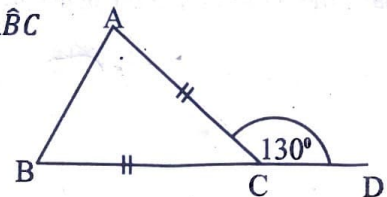


4. If the perimeter of the sector ABE shown in the figure is 25 cm, find the perimeter of the shaded part.



5. Simplify. $\frac{m^3}{2n} \div \frac{3m}{4n^2}$

6. If $AC=BC$ and $\angle ACD = 130^\circ$ in the given figure, find the value of $\angle ABC$



7. Solve $2x(x - 3) = 0$

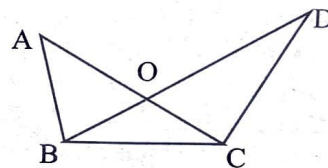
8. Place a (✓) in front of the correct statements.

| | |
|---------------------------|--|
| $\sqrt{5} + \sqrt{2} < 3$ | |
| $4\sqrt{2} = 8$ | |
| $\sqrt{4} < \sqrt{8} < 3$ | |

9. In the given figure, $\widehat{BAC} = \widehat{BDC}$, $\widehat{ACB} = \widehat{DBC}$

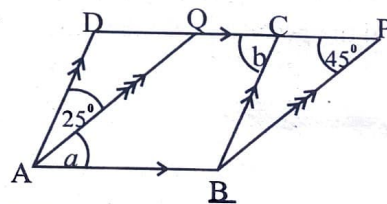
i. Name a pair of congruent triangles.

ii. Write the case of congruency.



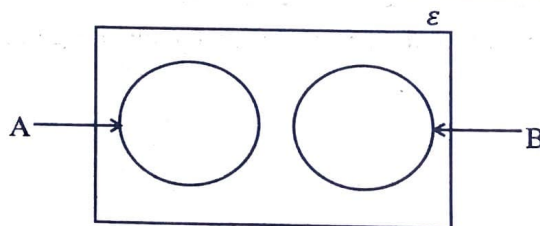
10. It takes 25 minutes to fill the half of a 2000l capacity tank with a pipe through which water flows at a uniform rate. What is the rate at which water flows through the pipe?

11. Find the values of a and b using the information given in the figure.



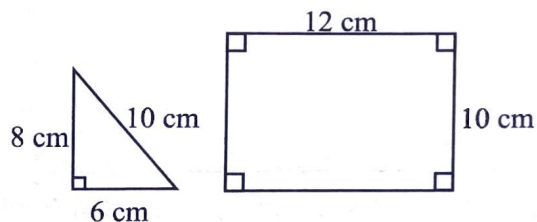
12. Factorize. $2x^2 - 9x + 10$

13. Shade the region $(A \cup B)'$ in the given Venn diagram.



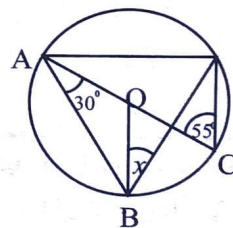
14. Solve. $\frac{3}{2x} = \frac{1}{x} + \frac{1}{4}$

15. The figure shows two different faces of a right triangular prism. Draw rough sketches of another two different faces of the prism.



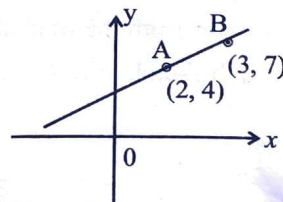
16. Find the first term of the geometric progression with common ratio (-3) and third term (-36)

17. O is the centre of the circle in the figure. Find the value of x using the given information.



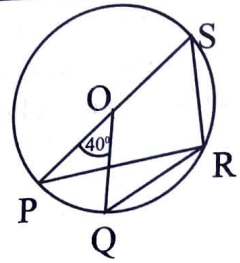
18. If $\log_5 x = 3$ find the value of x

19. Find the gradient of the line AB using the given information.



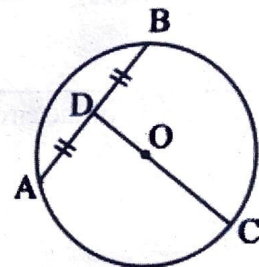
20. If the median is the 8th value of a frequency distribution ordered in ascending order, which value is the third quartile?

21. O is the centre of the circle given in the figure. If $\angle POQ = 40^\circ$ find the value of $\angle QRS$



22. A box contains identical red, blue and white beads. The number of blue beads is twice as the number of red beads and the number of blue beads and white beads are equal. Find the probability that the bead taken out randomly being a red bead.

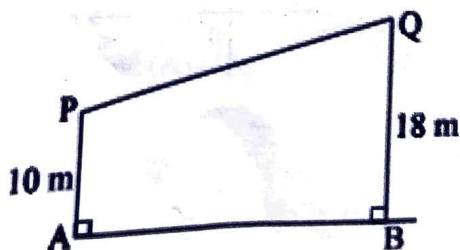
23. O is the centre of the circle given. If $AD = DB$, $AB = 12$ cm and $OD = 8$ cm. Find the radius of the circle.



24. The surface area of a right circular cylinder of radius 7 cm is 528 cm^2 . Find the height of the cylinder.



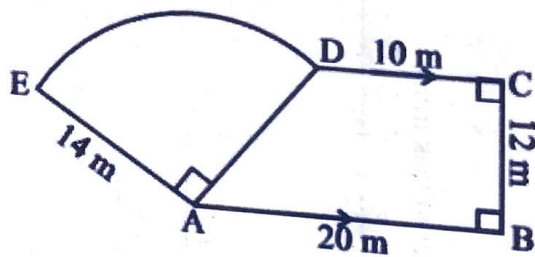
25. On a straight road AB, two houses P and Q are on the same side of the road at a distance of 10 m and 18 m from AB. A light post L should be fixed on the side of the houses from the road at a distance of 8 m from the road and equidistant from P and Q. Draw a rough sketch to find the location of L using the knowledge of loci and mark the point L.



PART B

1. (a) The quarterly rates payable for provincial council institution for a house of assessed annual value RS. 90 000 is Rs. 1 800.
 - i. Find the annual rates.
 - ii. Find the percentage that the provincial council institution charges as rates.
 - iii. If the annual rate of another house in the same area was Rs. 4320 in the same year, find the annual assessed value of the house.
- (b) Find the total amount that a man can get at the end of two years after depositing Rs 200 000 in a bank paying a 10% annual compound interest rate.

2. The figure shows a sketch of a floor of an exhibition booth with a trapezium ABCD and a sector ADE.



- i. Find the length of the curved border DE
- ii. Find the perimeter of the exhibition booth.
- iii. Find the area of the sector ADE.

- iv. If Rs. 500 is charged for a square metre for the ground reserved for the exhibition booth, how much will be paid for it?

3. After a man had travelled $\frac{1}{2}$ of a journey, due to an emergency he had to go back $\frac{2}{3}$ of the distance he had traveled.

i. What fraction of the total distance of the journey is the return distance?

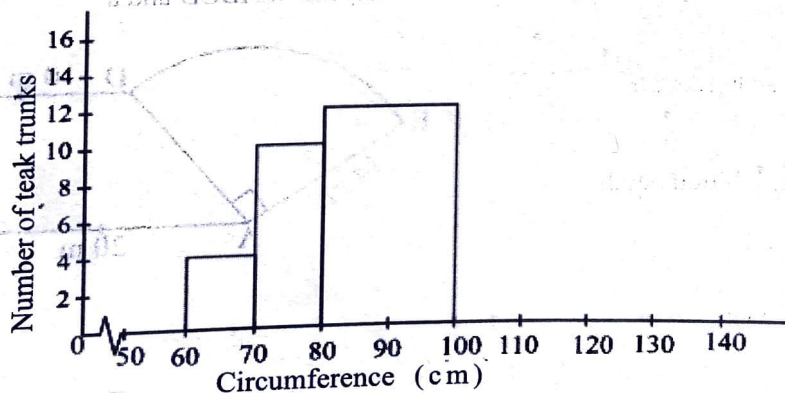
ii. What fraction of the total distance to be travelled to complete the journey now?

iii. After travelling half of the distance he should have travelled, the motor cycle ran out of fuel and stopped with 10 km to go. What fraction of the total distance had the motorcycle completed when it stopped?

iv. Show that the fuel in the motorcycle would have been enough to complete the journey if it had not to return again. (Consider the fuel combustion is uniform during the journey)

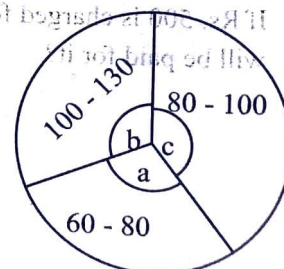
4. An incomplete table and incomplete histogram prepared based on the information obtained on the circumference of the teak trunks in a carpentry are given below.

| Circumference (cm) | 60 - 70 | 70 - 80 | 80 - 100 | 100 - 120 | 120 - 130 |
|-----------------------|---------|---------|----------|-----------|-----------|
| Number of teak trunks | 4 | | | 16 | 6 |

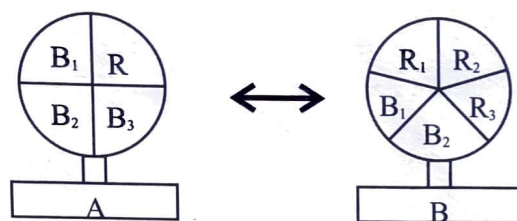


- Complete the table by using the given histogram.
- Complete the histogram using the table.
- Draw the frequency polygon on the histogram
- Below is an incomplete pie chart drawn using the above information. Find the magnitudes of the angles a, b, c

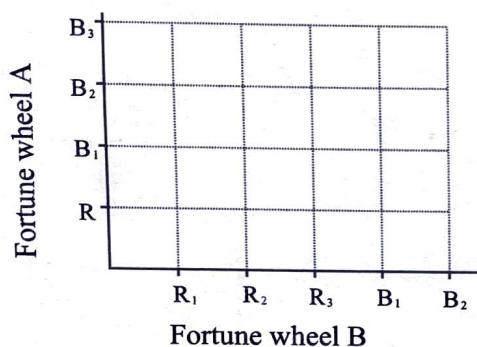
a =
b =
c =



5. (a) A and B are two fortune wheels. The colour in front of the arrow head is observed by rotating the two-fortune wheel.
Each fortune wheel is divided in to equal sectors. (R denote red colour and B denotes Blue colour)



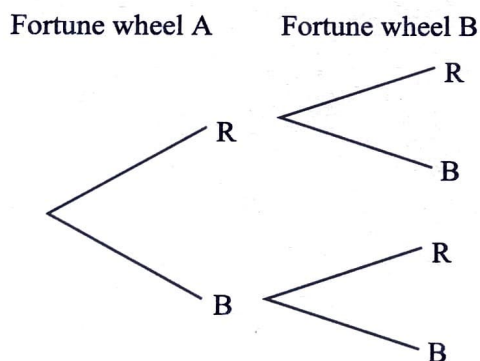
- i. Represent the sample space of the above experiment on the grid using symbol x



- ii. Encircle the event of getting same colour in both occasions and find the probability of it.

- (b) Below is an incomplete tree diagram related to the above experiment

- i. Complete the tree diagram with probabilities.



- ii. Which has more probability to get the same colour in both occasions or different colours in both occasions. Explain with reasons.

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ශ්‍රේණිය } Grade 11
தரம் }
Grade }
නම }
பெயர் }
Name }

MATHEMATICS II

කාලය } 3 hours
நேரம் }
Time }

විභාග අංකය }
சட்டிலக்கம் }
Index No. }

Extra 10 minutes for reading

Important

- Answer 10 questions by selecting 5 questions from part A and 5 questions from part B
- Each question carries 10 marks.
- Write relevant steps and the correct units in answering the paper.
- The volume of a cylinder of radius r and height is $\pi r^2 h$
- The volume of a sphere of radius r is $\frac{4}{3} \pi r^3$

PART A

Answer five questions only.

1. A person who owns 4 000 shares in a company gets Rs. 20 000 as dividend income for a year. He invests that amount and the amount obtained by selling all the shares to buy shares at market price of Rs.40 in another company paying a dividend of Rs. 8 per share. The dividend income received at the end of a year from this investment was twice as the dividend income received from the previous company. Find the selling price of a share in the previous company.

2. An incomplete table of values of x and y prepared to draw the graph of the function $y = x(x - 6) + 5$ is given below.

| | | | | | | | |
|-----|---|---|----|-------|----|---|---|
| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| y | 5 | 0 | -3 | | -3 | 0 | 5 |

(a)

- Find the value of y when $x=3$
- Using the scale of 10 small divisions as one unit along both x - axis and y axis, draw the graph of the function above.

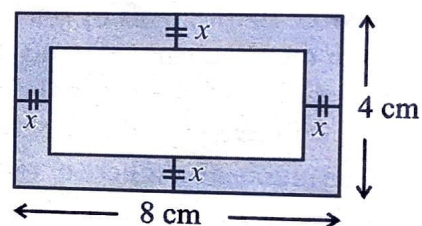
(b) using the graph,

- Write the range of values of x that the graph function decreases negatively.
- Express the function $y = x(x - 6) + 5$ in the form $y = (x + a)^2 + b$
- Write the coordinates of the turning point which is obtained when the above graph is moved 3 units along the negative direction of x axis.

3. (a) Twice the number of soldiers in camp A is equal to five times the number of soldiers in camp B. If 50 soldiers in camp A are transferred to camp B, then the number of soldiers in camp A equal to the twice the number of soldiers in camp B.
- By taking the number of soldiers in camp A as x and the number of soldiers in camp B as y construct a pair of simultaneous equation.
 - Solve the equations and find the number of soldiers in camp A and the number of soldiers in camp B separately.

(b) Simplify. $\frac{4}{x^2-1} + \frac{2}{x+1}$

4. After cutting out a part of breadth x cm from a rectangular plate of length 8 cm and breadth 4 cm as shown in the figure, the remaining area is 20cm^2 . Show that x satisfied the equation $x^2 - 6x + 3 = 0$ and find the value of x to the nearest first decimal place by solving the equation. ($\sqrt{6} = 2.45$)



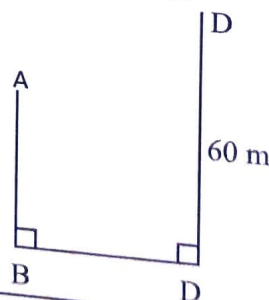
5. The information obtained about the monthly water consumption of a shopping complex is given below.

| Units of water consumption | 31 - 35 | 35 - 39 | 39 - 43 | 43 - 47 | 47 - 51 | 51 - 55 | 55 - 59 |
|----------------------------|---------|---------|---------|---------|---------|---------|---------|
| Number of shops | 7 | 12 | 15 | 20 | 25 | 12 | 9 |

- Find the modal class
- Find the mean water consumption of a shop to the nearest unit.
- If the charge for the first 30 units of water consumed is Rs. 50 per unit and each additional unit is charged Rs 60 per unit. While Rs. 600 is charged as the fixed charge. Calculate the average monthly water bill of a shop.

6. The figure shows a tree AB on a horizontal ground and a vertical light house CD of 60 m height. The angle of depression of B from C is 55° and the angle of depression of A from C is 30° .

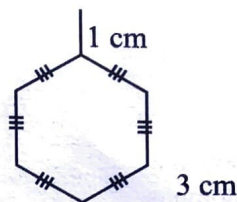
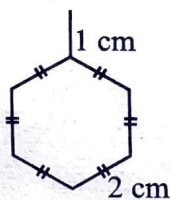
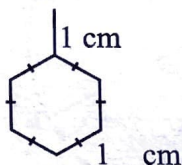
- Copy the figure and insert the information given.
- Draw a scale diagram to the scale of $1\text{cm} \rightarrow 10\text{m}$
- Find the vertical height of the tree AB and the length DB using the scale diagram.



PART B

• **Answer five questions only**

7. The figures given below are the first three stages of wire frames of regular hexagonal shaped.



- i. If the length of the wire used to make the first wire frame is 7cm, find the length of the wire used to make the second wire frame.
- ii. If the wire needed to construct the n^{th} wire frame is T_n show that $T_n = 6n + 1$
- iii. If the length of the wire needed to construct the last wire frame is 145 cm, find the number of wire frames constructed.
- iv. Show that a wire of length 18 m is not enough to make all the above wire frames.

8. Use only a straight edge with cm / mm scale a pair of compasses and show the construction lines clearly.

- i. Construct a straight line segment $AB = 6$ cm and construct the perpendicular bisector of it. Name the point of intersection of the perpendicular bisector and the line AB as X .
- ii. Mark the point C on the perpendicular bisector such that $\angle XAC = 60^\circ$
- iii. Construct the locus of the points equidistant from AB and AC and name the point where it meets CX as O
- iv. Construct a circle with O as the centre and OA as the radius.
- v. Name the point of intersection of the circle and OX produced as D and write the reasons for being AO and DB are parallel.

9. (a) $\frac{2}{3}$ of a right circular cylinder of diameter $2a$ and height $3a$ is filled with water. A hemispherical bowl of radius r was filled completely with water and poured in to the cylinder 12 times so as not to waste, exactly enough to fill the cylinder completely. Show that $r = \frac{a}{2}$

(b) Find the value of $\frac{\sqrt[3]{54.6}}{0.875}$ using logarithm table.

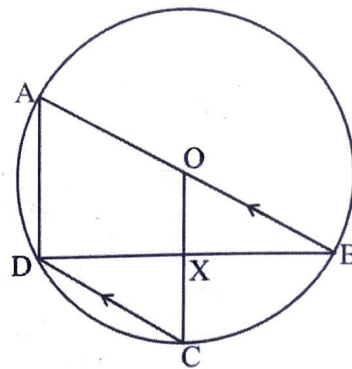
10. E and F are the mid points of the sides AB and AD in the parallelogram $ABCD$ respectively. AC and EF intersect at G . Show that $AC = 4 AG$

11. AB is the diameter of the circle with centre O as given in the figure. $AB \parallel DC$. If $\angle ABD = a^\circ$, find the values of the following angles with the reasons.

- $\angle BDC$
- $\angle BOC$
- $\angle BAD$
- $\angle OXD$

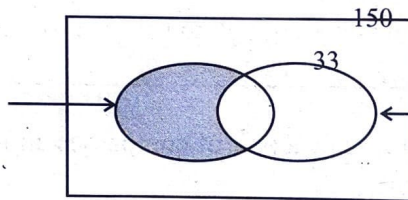
If $\angle ABD = a = 30^\circ$ show that,

- AOCD is a rhombus.



12. An incomplete Venn diagram drawn based on the information received during an investigation done by Consumer Service Authority on 150 packets of chillies for sale at retail outlet is given below.

Packets of expired chilli powder



Packets of chilli powder without minimum prescribed weight

- Copy the Venn diagram and insert the information below.

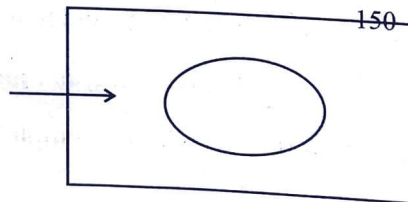
- Number of expired chilli powder packet is 40
- The number of chilli powder packets that are not expired but the packet without minimum prescribed weight is 5

- Name the packets of chilli powder shown in the shaded region

- How many chilli packets are not expired and in the prescribed weight?

All substandard chilli powder packets which are expired or do not have the prescribed minimum weight are not priced. The number of packets of chilli powder without mentioning the price is 120. An incomplete Venn diagram drawn according to the above information is given below.

chilli powder packets which are expired or do not have the minimum prescribed weight



- Copy the Venn diagram and show the set of chilli powder packet do not have the minimum prescribed weight and write the number of elements belonging to each area

PARCEL NO



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ඕනෑම තොරතුරු 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|
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පෙර පාසලේ සිට උසස් පෙළ දක්වා සියළුම ප්‍රශ්න පත්‍ර,
කෙටි සටහන්, වැඩ පොත්, අතිරේක කියවීම් පොත්, සඟරා
සිංහල සහ ඉංග්‍රීසි මාධ්‍යයෙන් හෙදරටම හෙත්වා ගැනීමට

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