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 தென் மாகாணக் கல்வித் திணைக்களம் தென் மாகாணக் கல்வித் திணைக்களம் தென் மாகாணக் கல்வித் திணைக்களம்
 Department of Education, Southern Province Department of Education, Southern Province Department of Education, Southern Province
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අවසාන වාර පරීක්ෂණය - 2024 (2025)

இறுதி தவணைப் பரீட்சை - 2024 (2025) / Year End Term Test - 2024 (2025)

ශ්‍රේණිය } Grade 11
 தரம் }
 Grade }

Mathematics - I

කාලය } 2 Hours
 நேரம் }
 Time }

නම }
 பெயர் }
 Name }

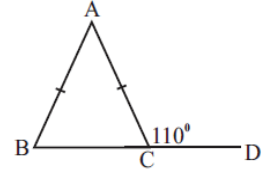
විභාග අංකය }
 சுட்டிලக்கம் }
 Index No. }

PART A

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

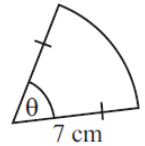
1) Value Added Tax (VAT) of 6% has to be paid for an item which is marked as Rs. 2000. What is the selling price of that item with the VAT.

2) Find the magnitude of $\hat{BAC}$ based on the information given in the figure.

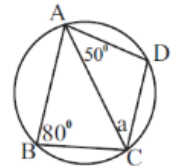


3) $(3x + 5)(x - 4) = 3x^2 - 7x - 20$. Find the solutions of quadratic equation $3x^2 - 7x - 20 = 0$.

4) A sector of a circle with perimeter 25 cm as shown in the figure has been cut out from a circle of radius 7 cm. Find the arc length of the sector.



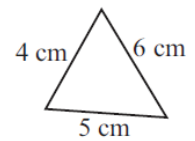
5) ABCD is a cyclic quadrilateral. Find the value of 'a' based on the information given in the figure.



6) Find the least common multiple of the following algebraic terms.
 $8a^2b$, $6ab$, $12b^2$

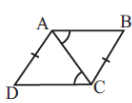


- 7) The areas of two rectangular faces of a right prism with triangular cross-section as in the figure are $(4\text{cm} \times 7\text{cm})$ and $(6\text{cm} \times 7\text{cm})$. Draw and write the measurements of the remaining rectangular face of the prism.

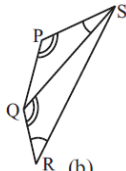


- 8) $\begin{pmatrix} 2 & 3 \\ 1 & 0 \end{pmatrix} \times \begin{pmatrix} 1 & 2 \\ 0 & -2 \end{pmatrix} = \begin{pmatrix} 2 & x \\ y & 2 \end{pmatrix}$ Find the values of x and y based on the multiplication of the given matrices.

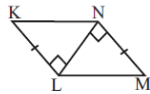
- 9) Fill in the blanks based on the information given in the figures.



(a)



(b)

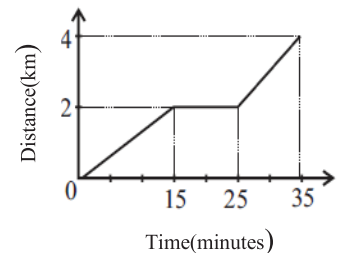


(c)

- Figure shows a pair of congruent triangles.
- They are congruent according to the case.

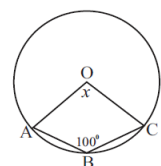
- 10) Find the common ratio of a geometric progression where the first term is 5 and the fourth term is 48.

- 11) The distance-time graph illustrates the motion of a child who went to a grocery shop from home and returned back. Find the speed at which child travelled to grocery shop in kilometers per hour.



- 12) Solve the inequality $2x + 3 \leq 5$ and find the largest integral solution for it.

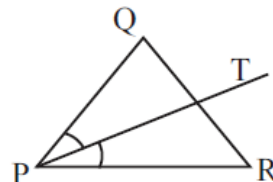
- 13) The centre of the circle shown in the diagram is O. Find the value of x based on the given information.



- 14) Fill in the blanks in the table given to represent the number of students studying aesthetic subjects in Grade 11 at a certain school, which only offers A , B and C subjects in a pie chart.

Subject	No of students	Angle at the centre
A	30	90°
B		150°
C	40	

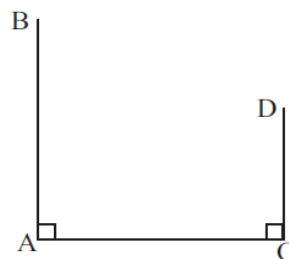
- 15) The locus of points equidistant from lines PQ and PR in triangle PQR and the locus of points equidistant from points P and Q intersected at point M. Using the knowledge of loci mark the point M.



- 16) $\frac{8a^4b^3}{3} \div \frac{4a^5b^2}{9}$ Simplify and write the answer with positive indices.

- 17) A and B are two sets. If $n(A) = 23$, $n(B) = 32$ and $n(A \cup B) = 40$, find $n(A \cap B)$.

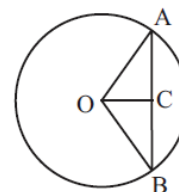
- 18) AB and CD are two vertical posts. Angle of elevation of D from A is 35° and angle of depression of C from B is 50° . Mark the above angles in the given figure.



- 19) $2.345 = 10^{0.3701}$. Find the value of $\lg 234.5$.

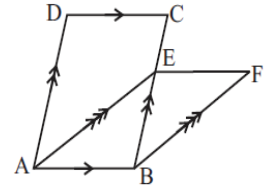
- 20) In the figure OA = 10 cm , OC = 6 cm and AC = 8cm. O is the centre and satisfies the relationship $10^2 = 6^2 + 8^2$.

- i) $\angle BCO = \dots\dots\dots$
 ii) the length of BC = $\dots\dots\dots$



- 21) A bag contains only identical red balls and blue balls with the total number of balls being between 20 and 30. The probability of drawing a red ball at random from the bag is $\frac{5}{8}$. How many blue balls are there in the bag?

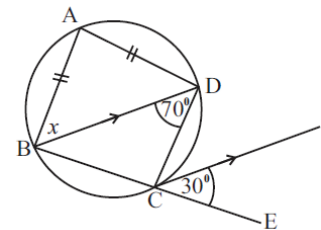
- 22) ABCD and ABFE are two parallelograms. If $\angle DCB = 75^\circ$ and $\angle DAE = 40^\circ$, find the magnitude of $\angle BFE$.



- 23) Thisev borrows a loan of Rs. 20 000 at annual simple interest. The simple interest rate for the first year is 12% and for the second year, it is 15%. How much more interest did he have to pay in the second year compared to the first year?

- 24) Simplify $\frac{11}{14a} - \frac{3}{7a} = \frac{5}{28}$

- 25) Find the value of x based on the information given in the figure.

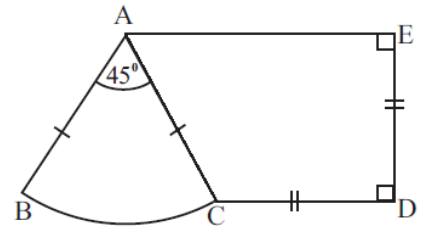


PART B

- Answer all questions on this question paper itself.

- 1) From a certain land, $\frac{1}{3}$ is cleared on the first day and $\frac{1}{5}$ is cleared on the second day.
- What fraction of the total land is cleared on the first two days?
 - If $\frac{6}{7}$ of the remaining part is cleared on the third day, what fraction of the total land is cleared on that day?
 - It is estimated that 3 men will need 2 days to clear the remaining part of the land. Find the total number of mandays required to clear the entire land.
 - A machine took 8 hours to complete the same task, while 18 men completed it in one day. Find the total number of machine hours needed to clear all the weeds on the land using the machine.

- 2) ABC is a pond in the shape of a sector of a circle with angle at the centre 45° located in a beautiful garden as shown in the figure. The radius of it is 70m. In the trapezium shaped part ACDE, $CD = DE = 56\text{m}$ and it is covered with grass.



- The bulbs are placed along the sector from B to C, with the distance between 2 bulbs being 5m. How many bulbs have been used?
- Find the perimeter of the pond.
- Find the area of the pond.
- The area of the part covered with grass is 2387 m^2 more than the area of the pond. Find the length of AE.

- 3) (a) Mr. Arjuna invested Rs. 60 000 in a certain company, which pays an annual dividends of Rs. 7 per share and received a total annual dividend of Rs.8400.
- i) How many shares did he buy?

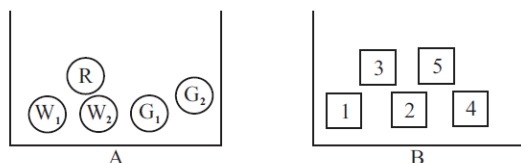
ii) What is the market price of a share?

iii) Later, he sold 1000 of the shares he owned at Rs.60 per share. Find the percentage of capital gain he received.

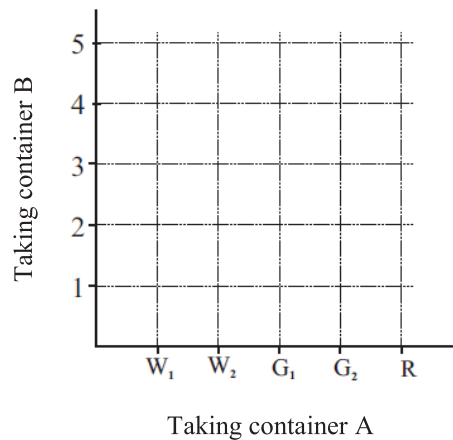
- (b) Nishantha who works in a private institute, has a monthly income of Rs. 200 000. Find the annual income tax he has to pay

Annual Income	Tax Percentage
Initial Rs. 1 200 000	Tax free
Next Rs. 600 000	6%
Next Rs. 600 000	12%

- 4) (a)

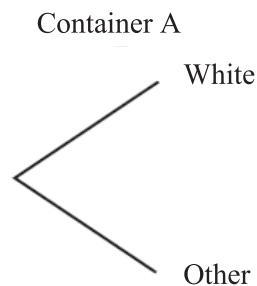


There are two containers prepared for a game. In container A there are 2 white balls, 2 balls and a red ball of the same shape and size. In container B there are 5 cards numbered from 1 to 5 of the same shape and size. A ball and a card are randomly taken out from containers A and B respectively. Represent the sample space of the above mentioned random experiment in the given grid using the symbol “x”.



Obtaining a prime number with a green ball or a multiple of 5 with a red ball is considered a win. Encircle the events of winning on the grid and find its probability.

- (b) Later the rules of the game are changed so that a card from container B is drawn only if the ball drawn from container A is white. In this case, obtaining a prime number is considered a win. Extend the given tree diagram and find the probability of a participant winning the game.

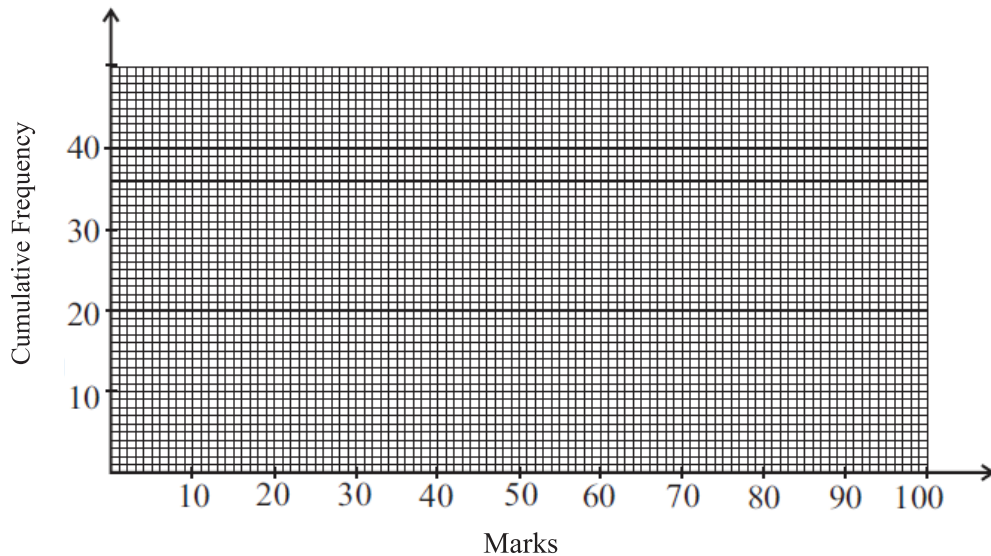


- 5) The following table shows the marks obtained by group of students for a mathematics paper out of 100.

Marks	Number of students	Cumulative Frequency
20 – 40	2	2
40 – 50	8	10
50 – 70	15	
70 – 80	8	33
80 – 90		38
90 - 100	2	40

- i) Fill in the blanks in the table.

ii) Draw the cumulative frequency curve on the given grid.



Based on the cumulative frequency curve,

iii) Find the median mark of a student.

iv) If 10% of the students who scored highest marks are to be selected, find the cutoff mark for selection.

v) If the marks scored by the above students are represented in a pie chart, find the central angle that represents the students who scored marks in the 40 – 50 range.



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ශ්‍රේණිය
தரம்
Grade

Grade 11

Mathematics - II

කාලය
நேரம்
Time

3 Hours

නම
பெயர்
Name

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විභාග අංකය
சட்டிலக்கம்
Index No.

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Additional reading time is - 10 minutes

- ❖ 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 cylinder of radius r and height h is $\pi r^2 h$. (Take $\pi = \frac{22}{7}$)

Part A

Answer five questions only.

- 1) * The price of a sewing machine is Rs. 60 000.
* Kamala takes a loan of Rs. 60 000 from a financial institution at a compound interest rate of 10% annum and agrees to repay it after 2 years and buys the sewing machine.
* Anula initially paid Rs 12 000 and purchased the sewing machine by agreeing to pay the rest over 2 years using the reducing balance method. She had to pay an annual interest rate of 12% on the remaining balance.
Show that Anula gains a profit of Rs. 6600 than Kamala.

- 2) An incomplete table of values prepared to draw the graph of the function

$$y = f(x) = 2 - x(x - 2)$$

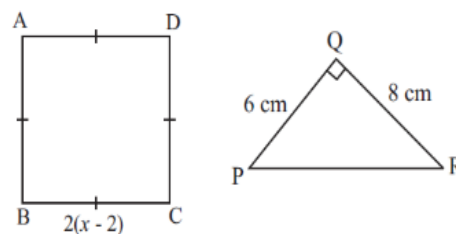
x	- 2	- 1	0	1	2	3	4
y	- 6	- 1	2	3		- 1	- 6

- Find the value of y when $x = 2$.
- Using the scale of 10 small squares representing one unit along the x -axis and along the y -axis, draw the graph of the above function on a graph paper.
- Find the range of values of x for which the value of $f(x)$ is decreasing, given that $-1 \leq f(x) < 1$
- Write the coordinates of the maximum value of the function and hence express the function in the form $f(x) = a - (x - b)^2$.
- By how much should the drawn graph be shifted along the y - axis to obtain the function $f(x) = - (x - 1)^2$.



- 3) a) A certain quantity of x books and y pens needed to be purchased. In shop A, the price of a book is Rs.60 and the price of a pen is Rs. 20. Purchasing the above mentioned items from shop A costs Rs. 1020. In shop B the price of a book is Rs. 55 and the price of a pen is Rs.25. To purchase the above items from shop B, it will cost Rs. 15 than the amount to be paid at shop A. Buildup a pair of simultaneous equations and by solving them find separately the number of books and the number of pens.
- b) When purchasing a quantity of n pens and $2n$ books separately from the two shops at the lowest prices, a total of Rs. 1050 is spent. Write an inequality to determine the maximum number of pens that can be purchased.

- 4) ABCD and PQR are two laminas with the same area. Show that the quadratic equation $x^2 - 4x - 2 = 0$ is satisfied by x and find the length of the side of the square lamina by taking $\sqrt{6} = 2.45$.

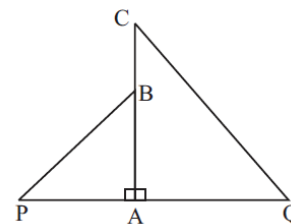


- 5) A seller is preparing to sell 50 kg of lime in 1 kg parcels.

Number of lime in 1kg	11 - 13	14 - 16	17 -19	20 - 22	23 - 25	26 - 28
Number of parcels	2	6		12	7	3

- Show that the modal class is 17 -19.
- By taking the mid value of the model class as the assumed mean or by other method find the mean number of limes in a parcel to the nearest whole number.
- Hence find the mean mass of a lime.
- Find the difference between the maximum and the minimum number of limes that could be in all parcels.

- 6) The points P and Q are collinear and lies on either side of the vertical post AC. The distance from A to P and Q are 42 m and 60 m respectively. The angle of elevation of point B from P is $65^\circ 10'$. The length of the tightly stretched wire PB which is tied, is equal to the height of AC.



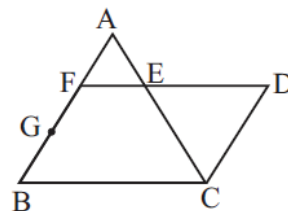
- Copy the diagram on to your answer sheet and mark the given data.
- Find the length of the BP wire.
- Find the magnitude of $\hat{AQC}$

Part B

Answer **five** questions only.

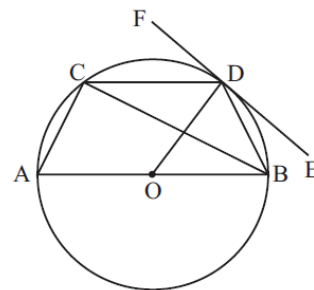
- 7) The 10th and 11th terms of an arithmetic progression are 77 and 80 respectively.
- Find the common difference.
 - Find the first term.
 - The last term of this progression is the largest number less than 150. $T_n < 150$. Find the number of terms in the progression.
 - Find the sum of the terms in the progression.
 - Hence, deduce the value of $(500 + 530 + 560 + \dots + 1490)$.

- 8) In the given figure $AF = FG = GB$. If $CD = 2AF$ and $AB \parallel DC$, show that $BCDF$ is a parallelogram and prove that $AC \cdot FE = FD \cdot AE$



- 9) Use only a straight edge with a cm/mm scale and a pair of compasses for the following construction.
- Construct the triangle ABC , such that $AB = 4.5$ cm, $BC = 6$ cm and $\angle B = 90^\circ$.
 - Construct the angle bisector of $\angle B$ and name the point where it intersects AC as D .
 - Construct a circle with centre D that touches AB at B .
 - Name the point where the circle touches the line AC as E and give reasons why $ABDE$ is a cyclic quadrilateral.

- 10) In the given figure AB is a diameter of the circle with centre O . $OD \parallel AC$ and the tangent drawn to the circle at D is EF . If $\angle BCD = x^\circ$,
- Mark the data on the given figure.
 - By giving reasons find the magnitude of the following angles in terms of x .

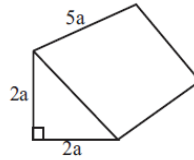
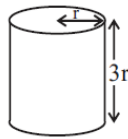


$\angle BOD, \angle CAO$ and $\angle BDC$

- Prove that
 - $CD = BD$
 - $EF \parallel BC$
 - $\angle ACB = \angle EDO$



- 11) A solid metal cylinder with base radius r and height $3r$ is melted and 5 metal prisms were made as shown in the figure without wasting any metal.



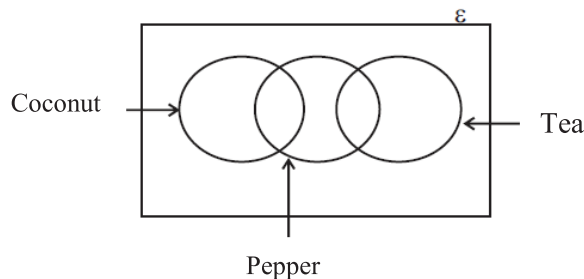
Show that the radius of the cylinder r is obtained by $r = a \sqrt{\frac{50}{3\pi}}$

When $3\pi = 9.42$ and $a = 3.275$, find the value of r using the logarithm tables.

- 12) The following information represents regarding 80 farmers who cultivate 3 crops coconut, pepper and tea.

- * 15 farmers do not cultivate any of the 3 crops.
- * The total number of farmers who cultivate tea is 33.
- * There are no farmers who cultivate both coconut and tea.

- i) Copy the given diagram on to your answer sheet and include the information given above.



- ii) Shade the region that represents the farmers who cultivate only pepper.
- iii) If the number of farmers who cultivate tea or pepper is 53, how many farmers cultivate only coconut?
- iv) 42 farmers cultivate only one crop and the number of farmers who cultivate only tea is twice the number of farmers who cultivate only pepper. How many farmers cultivate both tea and pepper?
- v) Find the probability of a randomly selected person being a farmer who cultivates 2 crops.