

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව  
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 Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka  
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 Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka

32 E I

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2021(2022)  
 கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2021 (2022)  
 General Certificate of Education (Ord. Level) Examination, 2021 (2022)

ගණිතය I  
 கணிதம் I  
 Mathematics I

පැය දෙකයි  
 இரண்டு மணித்தியாலம்  
 Two hours

Index Number: .....

Certified Correct

Signature of Invigilator

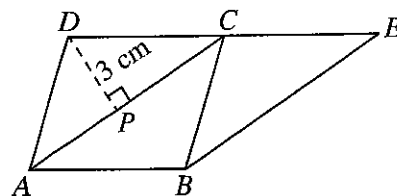
**Important:**

- \* This question paper consists of **8** pages.
- \* Write your **Index Number** correctly in the appropriate places on **this page** and on **page three**.
- \* Answer **all** questions **on this question paper itself**.
- \* Use the space provided under each question for working and writing the answer.
- \* Indicate the **relevant steps** and the **correct units** when answering the questions.
- \* Marks are awarded as follows:  
**In Part A**  
 2 marks for each question  
**In Part B**  
 10 marks for each question
- \* Blank papers can be obtained for scratch work.

**For Marking Examiners' Use Only**

| Part                        | Question Numbers     | Marks |
|-----------------------------|----------------------|-------|
| A                           | 1 – 25               |       |
|                             | 1                    |       |
|                             | 2                    |       |
| B                           | 3                    |       |
|                             | 4                    |       |
|                             | 5                    |       |
| Total                       |                      |       |
| .....<br>First Examiner     | .....<br>Code Number |       |
| .....<br>Second Examiner    | .....<br>Code Number |       |
| .....<br>Arithmetic Checker | .....<br>Code Number |       |
| .....<br>Chief Examiner     | .....<br>Code Number |       |

8.  $ABCD$  is a parallelogram.  $DC$  has been produced to  $E$  such that  $AC \parallel BE$ . If  $BE = 6$  cm and  $DP = 3$  cm, find the area of the trapezium  $ABED$ .



9. Find the least common multiple:

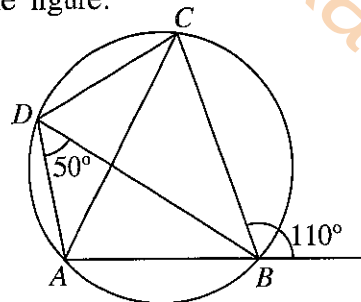
$$4x^2y, \quad 6xy, \quad 3y^2$$

10. A person who deposits 6000 rupees in a bank for 2 years at an annual interest rate of 5% compounded annually, receives 300 rupees as interest for the first year. How much interest does he receive for the second year?

11. The first quartile of a collection of data arranged in ascending order is in the 4<sup>th</sup> position. In which position is the median of this collection of data?

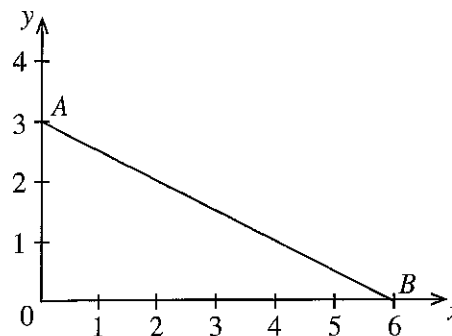
12. Find the minimum area of a sheet of paper that can be used to completely cover the curved surface of a solid right circular cylinder of radius 7 cm and height 5 cm.  
(Take the value of  $\pi$  as  $\frac{22}{7}$ .)

13. Find the magnitude of  $\hat{BAC}$ , based on the information in the figure.



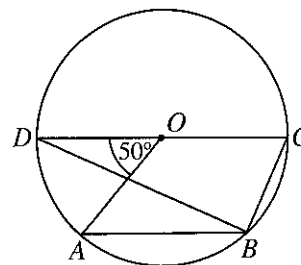
[see page four]

20. Obtain the equation of the straight line  $AB$  shown in the figure.



21. The 6<sup>th</sup> term of a geometric progression with common ratio 5 is 80. What is the 8<sup>th</sup> term of this progression?

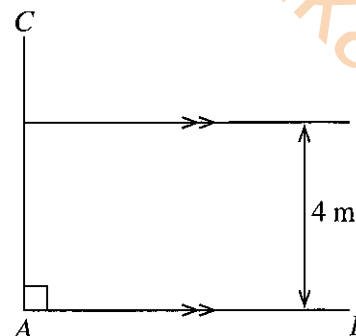
22. The centre of the given circle is  $O$ . Find the magnitude of  $\hat{ABC}$ .



23.  $A = (1 \ -3)$  and  $B = \begin{pmatrix} -1 & 2 \\ -1 & 1 \end{pmatrix}$ . Find the matrix  $AB$ .

24. A bag contains only identical red and black balls. The probability of a ball drawn at random from the bag being red is  $\frac{2}{7}$ . If there are 15 black balls in the bag, how many balls in total are there in the bag?

25.  $AB$  and  $AC$  are two perpendicular boundaries of a land. It is required to plant a tree at the point  $P$  which is 4 m from  $AB$  and 5 m from the corner  $A$ . An incomplete sketch relevant to finding this location is shown in the figure. Complete the figure using the knowledge on loci, and mark the point  $P$ .



3.

**'Sundara' Company**

Price of a share is 50 rupees.

Dividends of 2.50 rupees per share is paid annually.

Aruna invested 60 000 rupees to buy shares in the above company.

(i) How many shares did he buy?

(ii) After receiving dividends from the company at the end of a year, Aruna sells all the shares at 55 rupees per share. How much does he obtain in total as dividends and from selling all the shares?

(iii) Aruna deposits the total amount he gets in a bank for one year. If he receives 3450 rupees as interest from the bank for the year, what is the annual interest rate the bank pays?

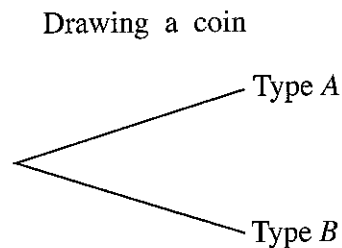
10

4. (a) In a bag there are 10 coins of two types as follows, which are identical in shape and size.

Type A – 7 fair coins

Type B – 3 coins with Head marked on both sides

(i) A coin is drawn at random from the bag. Complete the following incomplete tree diagram relevant to this.



(ii) The coin which is drawn is tossed and the side which falls face up is observed. Extend the tree diagram accordingly and include the relevant probabilities.

(iii) Find the probability of obtaining a head in the above experiment of drawing a coin and tossing it.

සියලුම හිමිකම් ඇවිරිණි / முழுப் பதிப்புரிமையுடையது / All Rights Reserved

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව  
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Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka

32 E II

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2021(2022)  
கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2021(2022)  
General Certificate of Education (Ord. Level) Examination, 2021(2022)

ගණිතය II  
கணிதம் II  
Mathematics II

පැය තුනයි  
மூன்று மணித்தியாலம்  
Three hours

අමතර කියවීමේ කාලය - මිනිත්තු 10 යි  
மேலதிக வாசிப்பு நேரம் - 10 நிமிடங்கள்  
Additional Reading Time - 10 minutes

Use additional reading time to go through the question paper, select the questions and decide on the questions that you give priority to in answering.

Instructions:

- \* Answer **ten** 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 right circular cylinder of base radius  $r$  and height  $h$  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. An incomplete table of  $y$  values corresponding to several  $x$  values of the quadratic function  $y = x^2 - 2x - 2$  is given below.

|     |    |    |    |    |    |    |     |   |
|-----|----|----|----|----|----|----|-----|---|
| $x$ | -3 | -2 | -1 | 0  | 1  | 2  | 3   | 4 |
| $y$ | 13 | 6  | 1  | -2 | -3 | -2 | ... | 6 |

- (a) (i) Find the value of  $y$  when  $x = 3$ .  
(ii) Using the standard system of axes and a suitable scale, draw the graph of the given quadratic function on the provided graph paper, according to the above table.
- (b) Using the graph that you drew,  
(i) write the interval of values of  $x$  on which the function is positive and increasing.  
(ii) write the coordinates of the minimum point of the graph and thereby write the quadratic function in the form  $y = (x - a)^2 + b$ . Here  $a$  and  $b$  are constants.
- (c) By considering the  $x$ -coordinate of an intersection point of the graph and the line  $y = 0$ , find a value for  $\sqrt{3}$  to the nearest first decimal place.

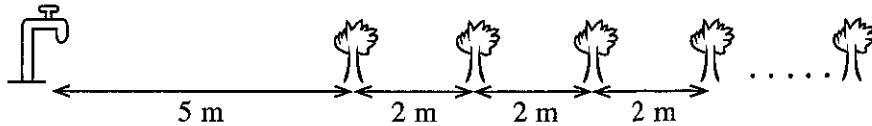
2.

A television set can be purchased by making an initial payment of 8000 rupees and paying the remainder in instalments.

A television set which is sold outright for 80 000 rupees can be purchased by making a down payment of 8000 rupees and paying the remainder in 18 equal monthly instalments. Here, an annual interest rate of 24% is charged and the interest is calculated on the reducing loan balance. How much is a monthly instalment that has to be paid when a television set is purchased in this manner?

**Part B***Answer five questions only.*

7. As shown in the figure, a tap and 18 flowering bushes are located such that they are collinear. The distance from the tap to the first flowering bush is 5 m and the distance between every two consecutive flowering bushes is 2 m.



- Write separately, the distance from the tap to the first, second and third flowering bushes respectively.
  - How far is the 8<sup>th</sup> flowering bush from the tap?
  - Which flowering bush is 37 m from the tap?
  - Piyumi fills a bucket with water from the tap, carries it to the first flowering bush, waters it and returns to the tap. She fills the bucket again with water, carries it to the second flowering bush, waters it and returns to the tap. She waters the flowering bushes up to the 18<sup>th</sup> one in this manner by carrying a separate bucket of water to each flowering bush respectively. Finally, she places the empty bucket next to the tap. Show that the total distance she walks during this activity is more than 790 metres.
8. Use only a straight edge with a cm/mm scale and a pair of compasses for the following constructions. Show the construction lines clearly.
- Construct the triangle  $ABC$  such that  $AB = 8.5$  cm,  $\angle B = 90^\circ$  and  $BC = 8.5$  cm.
  - Construct the bisector of  $\angle B$ . Name the point at which it meets  $AC$  as  $D$ .
  - Find the centre of the circle that has  $BD$  as a diameter and construct this circle.
  - Give reasons why the line  $AC$  is the tangent to the circle at  $D$ .
  - Construct another tangent to the circle from  $A$ .

9. (a) Prove the theorem, 'The opposite sides of a parallelogram are equal'.

- (b)  $ABCD$  is a parallelogram. The bisector of  $\angle B$  meets  $CD$  at  $T$ . The straight line drawn through  $C$  parallel to  $BT$  meets  $AB$  produced at  $X$  and  $AD$  produced at  $Y$ . Moreover,  $BT$  produced meets  $AY$  at  $Z$ .

Show that  $DZT$  is an isosceles triangle and thereby show that  $AB + AD = BX + DY$ .

