06 E I

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Department of Examinations, Sri Lanka

2564 - Mulika Piriven Final Examination - 2020 (2021)

(06) Mathematics

Paper I

One hour

Question No.	Marks
1 - 5	
6 - 12	
13 - 17	
18 - 20	
Total Marks	

* *Answer **all** the questions **on this paper** itself.*
* *Each question carries **02** marks. (02 × 20 = 40 marks)*

Index No:

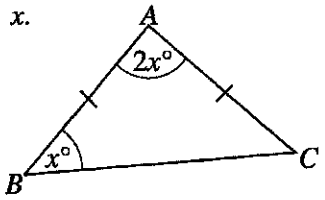
.....

1. It is given that $1296 = 2^4 \times 3^4$. Find the value of $\sqrt{1296}$.

2. Simplify: $\frac{1}{x} - \frac{1}{4x}$

3. A car takes 4 hours to travel a distance of 120 kilometres. What is its average speed in kilometres per hour?

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



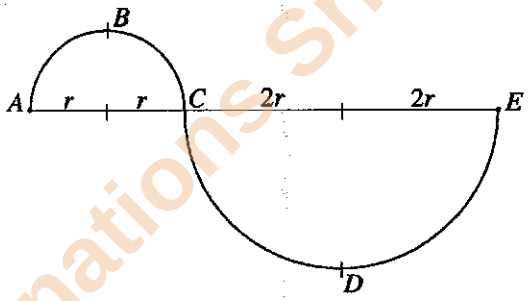
5. Find the equation of the straight line graph, whose gradient is –2 and the intercept is 1.

[See page two.

6. In a town, $\frac{2}{5}$ of the population speak Sinhala only. $\frac{1}{3}$ of the rest of the population speak English. Find the English speaking population as a fraction to the total population.

7. Make r, the subject of the equation: $A = 2\pi rh$

8. Out of the two semi-circles shown in the figure the arc length of the semi-circle ABC is 22 cm. Find the arc length of the semi-circle CDE.



9. The marks obtained for Mathematics by nine students are given below.

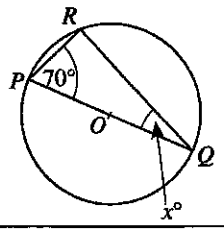
2, 5, 11, 13, 14, 23, 24, 27, 28

Find (i) the range,

(ii) the median

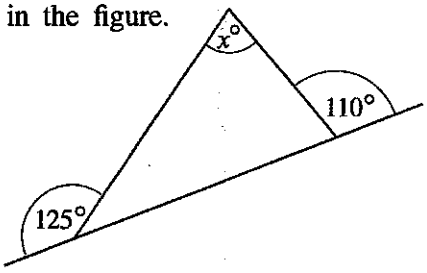
of them.

10. The centre of the circle in the given figure is O. Using the given information, find the value of x.



11. Find the smallest integer which satisfies the inequality $x + 1 \geq 3$.

12. Find the value of x according to the information given in the figure.

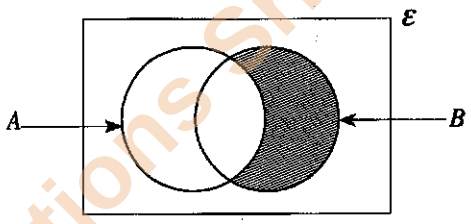


[*See page three.*

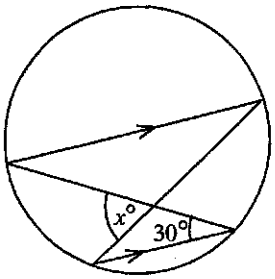
13. If $\begin{pmatrix} 3 & 0 \\ -2 & -1 \end{pmatrix} + \begin{pmatrix} 1 & 2 \\ -1 & y \end{pmatrix} = \begin{pmatrix} 4 & x \\ -3 & 3 \end{pmatrix}$, find the values of x and y.

14. If an item worth of Rs. 40000 is sold in order to make a 20% profit, find the selling price of it.

15. Using set notation, write the shaded area of the Venn diagram given.

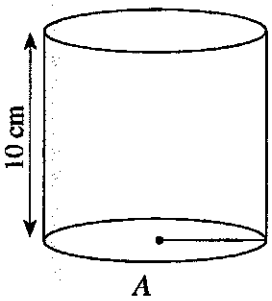


16. Find the value of x according to the given information in the figure.

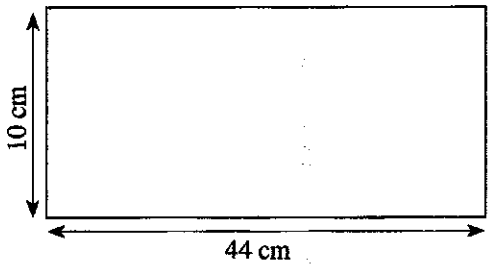


17. Figure *A* shows a thin, empty cylinder. Cutting its curved surface perpendicular to the base and unfolding, it can be obtained a rectangular shape as shown in figure *B*.

Using the given information, find the radius of the base of the cylinder.



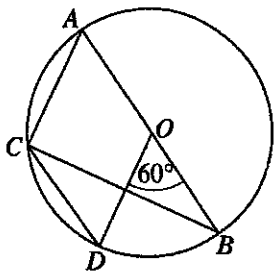
A



B

[*See page four.*

18. The centre of the circle in the given figure is O. Find the magnitude of the $A\hat{C}D$ according to the given information.

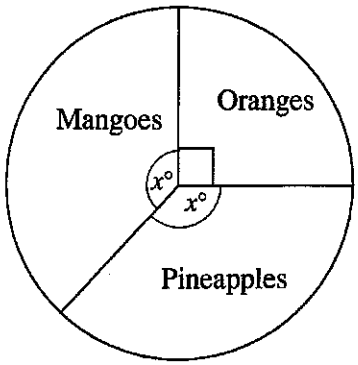


19. A bag contains three identical balls. Out of them, two balls are white and the other is red. Two balls are randomly taken from the bag together. Find the probability of the event that one of the balls is red and the other is white.

20. The following pie chart shows information about fruits which are available in a fruit stall.

(i) Find the value of x.

(ii) If the fruit stall has 300 oranges, find the number of mangoes available in it.



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06 E II

Question No.	Marks
1	
2	
3	
4	
Total Marks	

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Department of Examinations, Sri Lanka

2564 - Mulika Piriven Final Examination - 2020 (2021)

(06) Mathematics

Paper II

Three hours | **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 in answering.

* *Answer **all** questions in **Part A** and **five** questions from **Part B**.*
* *Use* $\frac{22}{7}$ *for the value of* π .

Index No: .....

Part A

- Answer **all** the questions in part **A on this paper itself** and attach to the answer scripts of part **B** and handover.
- *Each question caries **05 marks**.* (05 × 4 = 20 *marks*)

1. Saman invested Rs. 50 000 to buy shares of a company at the rate of Rs. 25 per share. The company pays an annual dividend of Rs. 2.50 for a share.

   (i) How many shares did Saman buy?

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   .....

   (ii) Find the annual income of Saman from dividends.

   .....

   .....

   (iii) After receiving the annual dividend, Saman sells all of his shares at Rs. 27 each. Find his capital gain.

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2. The figure shows a small crescent stone (semi circular component) and a rectangular step attached to it in a temple premises.

   (i) Find the radius of semi-circular crescent stone.

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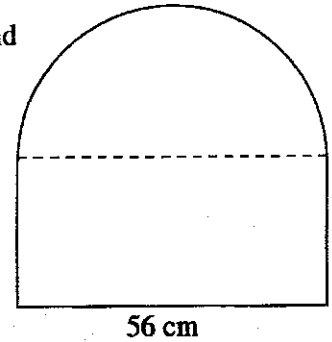

[*See page two.*

(ii) If the area of the crescent stone is equal to the area of the rectangular step, find the width of the rectangular step.

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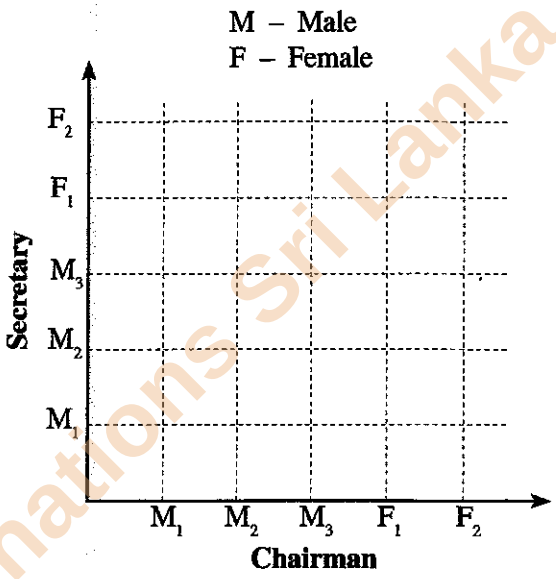
3. It is expected to select two students from three male students and two female students in a school for the posts of Chairman and Secretary of the Buddhist society.

(i) Draw the sample space showing the possibilities of selecting two students from the five students appeared for the two posts, using symbol 'X' on the grid.

(ii) Indicate on the grid that the event of selecting the two as the Chairman and the Secretary being a male student and a female student and find its probability.



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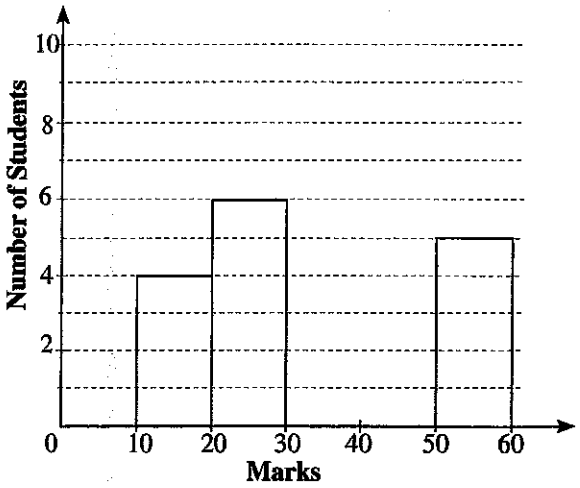
4. The following incomplete frequency distribution and the incomplete histogram are prepared according to the marks obtained by a group of students at an examination. Here the interval 10-20 represents marks which are greater than or equal to 10 and below 20. Other intervals also have the similar meaning.

(i) Complete the frequency table and the histogram.

Marks	Number of Students
10 - 20	4
20 - 30	...
30 - 50	10
50 - 60	5



(ii) Write the number of students who obtained marks below 30 as a percentage of the total number of students.

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[See page three.

* *

Part B

* *Answer **only five** questions from this section. **08** marks are awarded for each question.*

(The volume of a right circular cone with base radius r, height h and the slant height l is $\frac{1}{3}\pi r^2 h$ and the area of the curved surface is πrl)

5. At the entrance of a temple, there are flag-poles positioned such that the distances from the Ornamental arch (Dragon arch) to flag-poles are 7 m, 10 m, 13 m and so on.

(i) Find the distance to the 12th flag-pole from the Ornamental arch.

(ii) Which flag-pole is situated from 64 m away from the Ornamental arch?

(iii) If the distance to the last flag-pole from the Ornamental arch is 79 m and there are flag-poles on both sides of the road in the same pattern, find the total number of required flag-poles.

6. The following incomplete table shows some y values corresponding to x values of the quadratic function $y = x^2 + 2x - 3$

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

(i) (a) Find the y value corresponding to $x = 1$.

(b) Choosing a suitable scale, draw the graph of the above function on the provided graph sheet.

(ii) Using your graph,

(a) Write the equation of the symmetric axis.

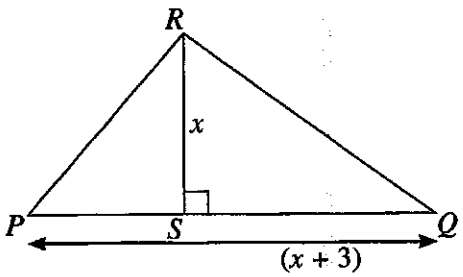
(b) Write the interval of x where the function is negative.

(c) Express the given quadratic function in the form $y = (x + a)^2 + b$. (Here a and b are constant numbers.)

7. (i) In the triangle PQR shown in the figure, the perpendicular line drawn from R to the side PQ is RS. Area of the triangle is 5 cm^2.

(a) Construct a quadratic equation using the area of the triangle in terms of x.

(b) Find the value of x by solving the equation.



(ii) Solve: $\frac{(x+3)}{4} - \frac{(x-3)}{5} = 2$

8. Use only a straight edge with cm/mm scale and a pair of compasses for the following constructions.

(i) Construct the triangle ABC such that $AB = 7$ cm, $B\hat{A}C = 60°$ and $AC = 5$ cm.

(ii) Measure and write the length of the side BC.

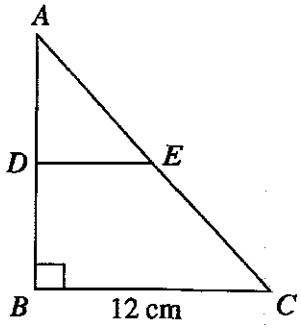
(iii) Construct the bisector of $B\hat{A}C$.

(iv) Construct the perpendicular line at B to the side AB such that the bisector drawn in part (iii) produced meets at D.

(v) Construct the circle such that the centre of the circle is D and the radius is DB.

[*See page four.*

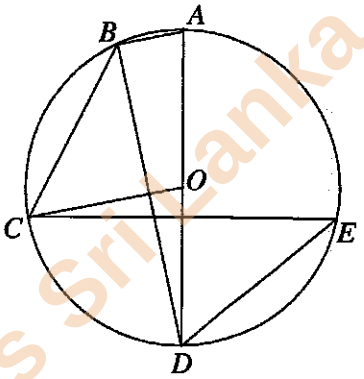
9. (1) In the right angled triangle ABC shown in the figure, the mid points of sides AB and AC are D and E respectively. $BC = 12$ cm.



(a) What is the magnitude of $A\hat{D}E$?. Justify your answer.

(b) The mid points of the sides AD and AE are P and Q respectively. Copy the figure onto your answer script and mark the points P and Q, and also find the length of PQ.

(ii) The centre of the circle shown in the figure is O. AD is a diameter and $C\hat{E}D = 40°$.

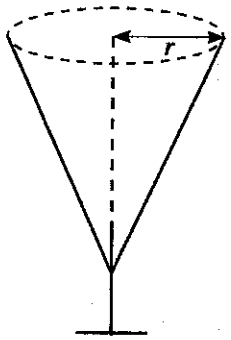


(i) Find the magnitude of $D\hat{O}C$.

(ii) Name a right angle. Justify your answer.

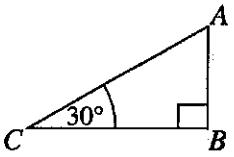
(iii) Find the value of $A\hat{B}C$.

10. (i) The figure shows a conic shaped thin pot. The slant height of it is 12.52 cm and the radius of circular face is 7 cm. (Consider $\pi = \frac{22}{7}$)



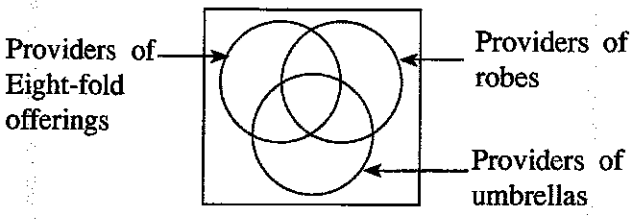
Using logarithms, find the area of the external curved surface of the pot.

(ii) Given in the figure, AB is a straight pole. C is also a point located on the level ground where B is located. It is given that $CA = 18$ m and $A\hat{C}B = 30°$. Using trigonometric ratios, find the height of the pole AB.



$(\sin 30° = \frac{1}{2},\ \cos 30° = \frac{\sqrt{3}}{2},\ \tan 30° = \frac{1}{\sqrt{3}})$

11. For an alms-giving in a temple, 40 patrons of the council of patrons decided to provide one or more types out of the three types of offerings Eight-fold offerings (Atapirikara), robes and umbrellas. Accordingly, 20 patrons provided Eight-fold offerings and 10 patrons provided umbrellas. Five patrons provided robes and umbrellas, and out of them, two patrons did not provide Eight-fold offerings.



(i) Copy the Ven diagram onto your answer script and denote the given information. How many patrons provided all three types of offerings?

(ii) If four patrons provided only umbrellas, how many patrons provided both Eight-fold offerings and umbrellas?

(iii) Shade the area relevant to patrons who did **not** provide any of these three offerings.

(iv) Find the probability that a patron selected from the patrons who provided these offerings being a patron provided only robes.

[*See page five.*

12. The following frequency distribution table shows daily wages of the employees of a certain company.

Daily wages(in Rupees) (Class interval)	**Number of employees (Frequency)**
750 - 850	10
850 - 950	15
950 - 1050	50
1050 - 1150	20
1150 - 1250	5

(i) What is the class interval which represents 50% of the employees?

(ii) According to the given information, find the mean of the daily wage of an employee.

(iii) The company owner says that Rs. 3 000 000 is enough to pay the wages to 150 employees of a company where wages are paid similar to the above campany for 20 working days. Is this statement true? Justify your answer.

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