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Department of Examinations, Sri Lanka

2563 – Mulika Piriven Final Examination – 2019 December

NEW (New Syllabus) **06 E I**

(06) Mathematics

2018.12.21 / 08.30–09.30 **Paper I**

One hour

Question. No.	Marks
1–5	
6–12	
13–18	
19–20	
Total Marks	

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

Index No :

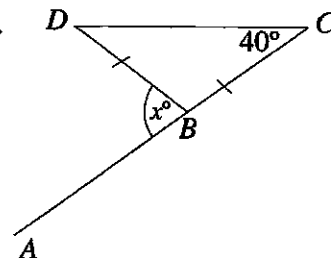.................................

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1. It is given that $144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$. Then find the square root of 144.

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2. Simplify: $\dfrac{7}{3x} + \dfrac{1}{3x}$

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3. Find the time taken by a car to travel 60 km distance, if the travelling speed of the car is 40 kmh⁻¹.

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

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5. Find the gradient of the straight line obtained by joining two points (2, 5) and (3, 7).


[*See page two*

6. A work can be finished by 8 men within 9 days. How many days will it be taken by 12 men to finish the same work?

7. Make m as the subject of the equation: $y = mx + c$.

8. The area of the curved surface of a straight cylinder with base radius 7 cm is 440 cm². Find the height of the cylinder.
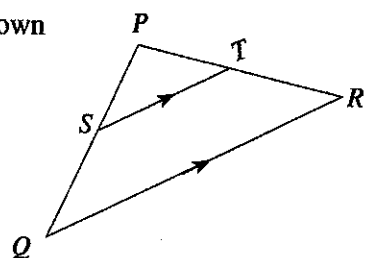
9. If the median of the numbers 1, 3, 4, x, 5, 5, 6, 8 is 4.5, then find x.

10. Find the remaining condition in order to be congruent the given two triangles ABC and PQR under **S.A.S.**
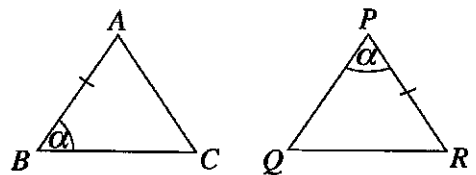
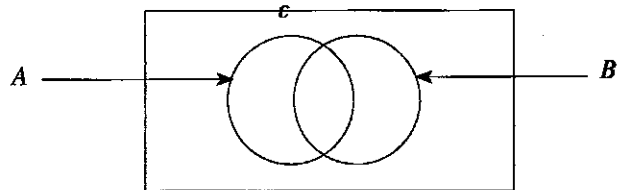**11.** Find **two** positive integers that satisfy the inequality $x - 3 < 1$.

12. In the given triangle, S is the midpoint of the side PQ. If $ST /\!/ QR$, write down the relation between PT and TR.
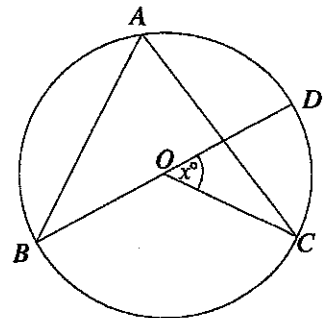
13. If $A = \begin{pmatrix} 3 & -1 \\ 1 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} -1 & 0 \\ 3 & -2 \end{pmatrix}$, find the matrix $A + B$.

14. Write the expression $\log_3 81 = 4$ in the exponential form.

15. Shade the region which belongs to $(A \cup B)'$ in the given Venn diagram.

16. The centre of the given circle is O and $B\hat{A}C = 80°$.
Find the value of x.

17. In the given figure BC is a vertical pole. The point A is located on the horizontal ground 10 m away from the base of the pole. The angle of elevation of the point B from point A is $48°$. Denote these information in the given figure.
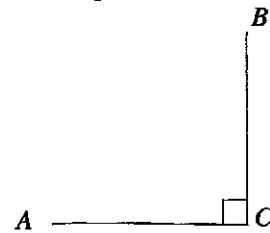
18. In the given figure, $ABCD$ is a cyclic quadrilateral. The side CD has been extended to E. If $B\hat{C}D = 100°$, find the value of x.
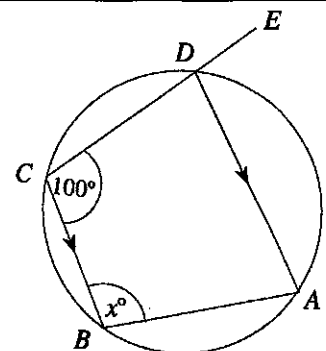
19. A bag contains 8 red balls and some white balls with same shape and same size. When taking a ball from the bag randomly, the probability of getting a white ball is $\frac{3}{7}$. Find the number of white balls in the bag.

20. The following histogram contains the marks obtained by students for Mathematics. Find number of students whose marks are in the interval 20 – 40.

* *
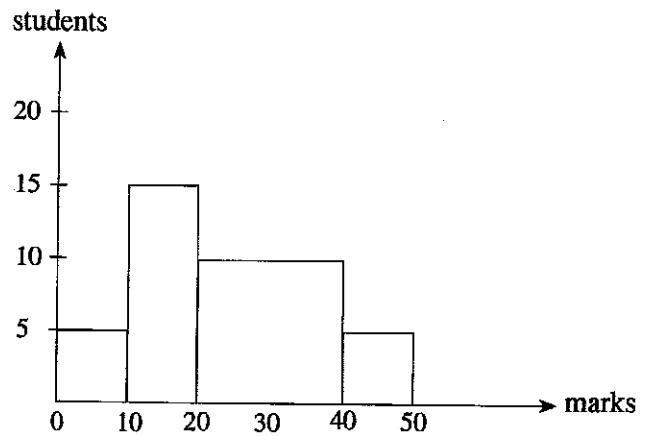
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Department of Examinations, Sri Lanka

2563 – Mulika Piriven Final Examination – 2019 December

NEW

(New Syllabus)

(06) Mathematics

2019.12.21 /12.30 – 15.40

Paper II

06 E II

Three hours

Additional Reading Time – 10 minutes

Question. No.	Marks
1	
2	
3	
4	
Total Marks	

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 :

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Part A

● Answer **all** the questions in part **A on this paper itself** and attach with answer scripts of part **B** and hand over.

● *Each question carries 05 marks.* *(05 × 4 = 20 marks)*

1. A seller bought a table for Rs. 5 000 to sell.

    (i) If the seller marked the selling price in order to get a 20% profit, find the marked price.

    ....

    ....

    (ii) If it was given a 5% discount when selling the table, find the selling price.

    ....

    ....

    (iii) What was the actual profit got by the seller from this selling?

    ....

2. The given figure is a plot of a flower bed consist of rectangular and semi-circular parts.

    (i) Find the radius of the semi-circular part.

    ....

    ....
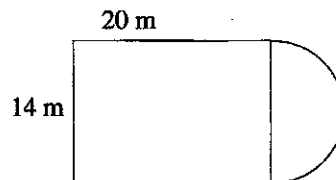
    (ii) Find the arc length of the semi-circular part.

    20 m

    14 m

    ....

    ....

    (iii) Find the area of the flower bed.

    ....

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[See page two.

3. The following pie chart shows the preferences for the subjects Mathematics, Science and Buddhism given by students in a particular class.
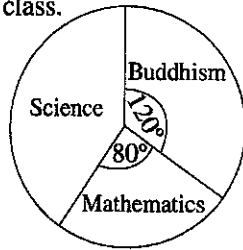
(i) What is the magnitude of the central angle of the sector which represents Science in the pie chart?

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....

(ii) Write the number of students who like Mathematics as a fraction of the total students in its simplest form.

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(iii) If the number of students who like Buddhism is 12, find the total number of students in the class.

....

....

....

....

4. In a particular day 75 devotees offered flowers out of all who came to a temple. Both flowers and oil lamps were offered by 8 devotees and number of devotees who offered only oil lamps was twice the number of people who offered both flowers and oil lamps.

(i) Denote above information in the Venn diagram given.

devotees who offered flowers → ← devotees who offered oil lamps
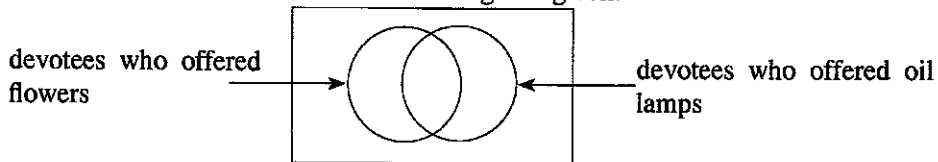
(ii) If 100 devotees came to the temple, find the number of devotees who offered **neither** flowers **nor** oil lamps.

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(iii) If a devotee is selected randomly from the above devotees, find the probability that the selected devotee is a person who offered only oil lamps.
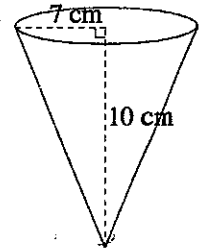
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Part B

● 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 and height h is $\frac{1}{3}\pi r^2 h$)

5. For a design, some pieces of ribbon were cut such that the length of the first piece 15 cm, second piece 20 cm and so on. The lengths of the pieces considered in order are in an arithmetic progression.
    (i) Find the length of the 8th piece of ribbon.
    (ii) Which piece has the length of 65 cm?
    (iii) If the design needed 12 pieces of ribbon, giving reasons, show whether a 5 m long ribbon is sufficient to cut all 12 pieces.

6. A right circular cone with base radius 7 cm and height 10 cm is filled with water.
    (i) Find the volume of the cone.
    (ii) The water in the above cone is poured into a prismatic glass vessel with a uniform right triangle cross section and the lengths of the sides which have the right angle 8 cm each. If the water doesn't spill out from the prism, what would be the level of water in the prism?

7. The following table shows the values of x and y, suitable to draw the graph of the function $y = (x-1)^2-3$.

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

    (i) (a) Find the value of y when $x = 2$.
        (b) Choosing a suitable scale, draw the graph of the above function on the provided graph paper.
    (ii) Using the graph,
        (a) Find the equation of the symmetric axis.
        (b) Find the interval of x where the function is negative.
        (C) Find the roots of the equation $(x + 2)^2 - 5 = 0$.

8. Do the following constructions using only a straight edge with a cm/mm scale and a pair of compasses.
    (i) Construct the triangle ABC with $AB = 8$ cm, $B\hat{A}C = 60°$ and $AC = 6.5$ cm.
    (ii) Measure and write the length of the side BC.
    (iii) Construct the bisector of $A\hat{B}C$.
    (iv) Construct the inscribed circle of the triangle ABC.

9. (i) Simplify : $\dfrac{3}{2x^2y} + \dfrac{1}{xy}$

    (ii) Factorize : $15a^2 - a - 2$.

    (iii) The price of a Ghee oil lamp is five times the price of an empty oil lamp. The cost for five Ghee oil lamps and ten empty oil lamps was 210 rupees.
   (a) Let a be the price of an empty oil lamp and b be the price of a Ghee oil lamp. Using a and b construct two simultaneous equations.
        (b) Solving the above equations, find the price of a Ghee oil lamp and the price of an empty oil lamp separately.

10. A box contains 4 rose fragrance incense sticks and 6 jasmine fragrance incense sticks with same size and same shape. One incense stick is taken from the box randomly and lighted. An incomplete tree diagram drawn to show the above information is given below.

first draw

$\dfrac{4}{10}$ Rose

....   Jasmine
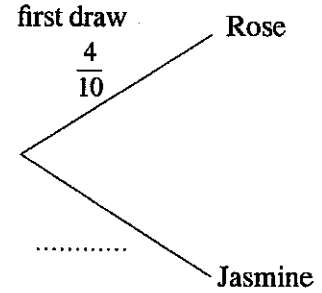
    (i) Copydown the above tree diagram onto your answer script and write the relevant probability in the blank.

   (ii) If another incense stick is taken from the box, extend the above tree diagram to indicate second draw showing the relevant probabilities.

  (iii) Write the probability that both incense sticks taken out are in two fragrances.

  (iv) A student claims that the probability of getting both incense sticks with same fragrance is greater than 60%. Is this statement true? Justify your answer.

11.   (i) The centre of the given circle is O and $AB \parallel DC$. The side AD is produced up to E. If $A\hat{B}D = 40°$ and $C\hat{D}E = 70°$, find the magnitude of $D\hat{B}C$.
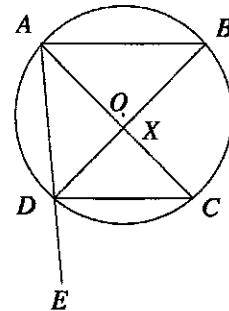
  (ii) $ABCD$ is a parallelogram. The bisector of $A\hat{B}C$ is BE. The line drawn parallel to BE through C meets the AB produced at F.

     (a) Show that $B\hat{F}C = B\hat{C}F$.

     (b) Show that $AF = BC + CD$.
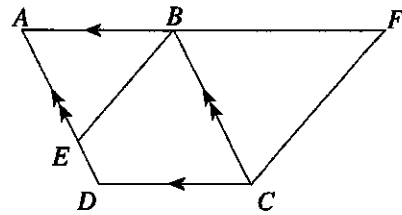
12. The following frequency distribution table contains the information about money donated for the monthly electricity bill by 30 people who observed 'Sil' on a Poya day at a temple.

Money donated in Rs. (Class interval)	5 – 15	15 – 25	25 – 35	35 – 45	45 – 55	55 – 65
Number of people [frequency(f)]	2	5	6	10	4	3

    (i) Write the class interval which shows most number of people donated money.

   (ii) Copy the above table and complete it by adding a column for mid value (x) and another column for fx.

  (iii) Hence, find the mean value of the money donated by one person.

  (iv) If 100 people observed 'Sil' on the Poyaday of a certain month at the temple, giving reasons, show whether the money expected to be donated is sufficient to pay the Rs. 4000 electricity bill of the month.

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