

**Education Zone - Negombo**  
**Second Term Evaluation - 2016**  
**Mathematics - I**

**Index No:** .....

**Grade 10**

**Paper I**

**2 Hours**

**Part A**

- ★ Answer all the questions in Part A and Part B on this paper itself.
- ★ Each question in Part A carries 2 marks.
- ★ Each question in Part B carries 10 marks.

01. If the perimeter of a rectangle with a length 'a' the breadth 'b' is 'p,' write down an expression for P.

02. Between which complete squares does the value of  $\sqrt{115}$  lie?

03. Use the symbol '>' or '<' for the blank

$$\frac{3}{4} \dots\dots \frac{2}{3}$$

04. Calculate the amount of  $\frac{1}{4}$  of 200 metres.

05. Expand the binomial expression  $(x-2)(x+2)$  and simplify.

06. If  $a+b = 3$  and  $ab = 1$ , find the value of  $a^2 + b^2$

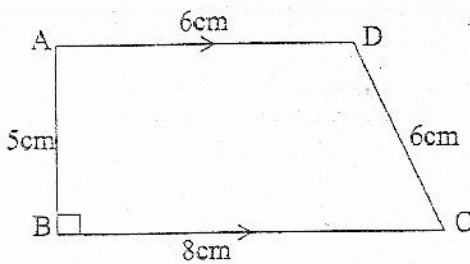
07. Write down the term that should be added to  $x^2 + 6x + \dots$  to become a complete square.

08. Write two cases of congruency of two triangles.

09. Fill in the blanks.

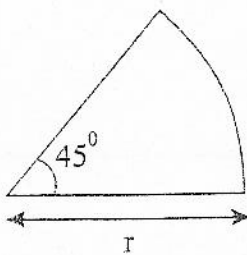
$$\begin{array}{r} 4 \square \\ 4 \overline{) 2025} \\ \underline{16} \phantom{0} \\ 425 \\ \underline{425} \\ 0 \end{array}$$

10.



Find the area of ABCD.

11.



Find the radius of the sector with an area of  $77 \text{ cm}^2$ .

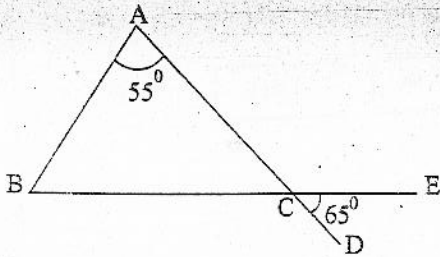
12. Factorise  $P^3 - P$ .

13. Consider the pair of algebraic terms  $5xy$  and  $-2xy$ .

(i) Find the product of the two terms.

(ii) Find the sum of the two terms.

14. According to the figure given, find the value of  $\hat{ABC}$



15. Fill in the blank by using the direct proportions.

$$2 : 5 = 4 : \boxed{\phantom{00}}$$

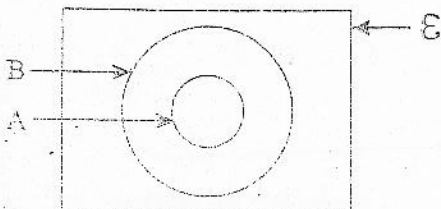
16. Make 'F' as the subject of the formula

$$C = \frac{5}{9} (F - 32)$$

17. Calculate the time needed for a motor car which travels with a uniform speed of  $90 \text{ kmh}^{-1}$  to travel 210 km.

18. 3 men spent 4 days to complete a particular piece of work. How many days will be needed for 4 men to finish the same piece of work?

19. Shade the region that represents the set  $A' \cap B$  in the Venn diagram given below.



20. Write the equation of the graph with the intercept 2 which travels through the point (3,2).

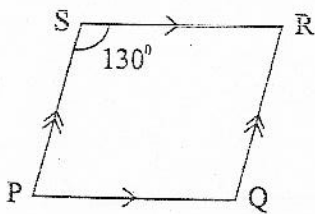
21. Write how you calculate the value of  $7.2 \times 25$  using a scientific calculator.

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7
.....
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180

22. Express  $\lg 4.4 = 0.6435$  in index form.

23. If  $\log_x 81 = 4$ , find the value of  $x$ .

24. By giving reasons, find the magnitude of  $\hat{SPQ}$ .



25. Find the L.C.M of the algebraic expressions given below.

$(y - x), 2(x - y), 2x^2(x - y)^2$

Part B

Answer all the questions on the paper itself.

01. (i) If  $\lg 2 = 0.3010$  and  $\lg 3 = 0.4771$ , find the value of  $\lg 1.5$ . (03 Marks)

(ii) By using the logarithmic tables, find the value of : (04 Marks)

$$\frac{59.42 \times 92.75}{8.421}$$

(iii) Solve (03 Marks)

$$\log_2 12 - \log_2 3 - \log_2 4 + \log_2 2$$

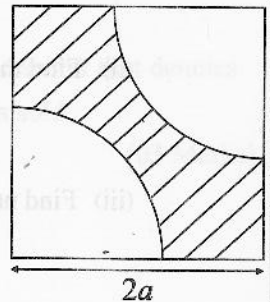
02. The shaded portion in the figure is separated by removing 2 sectors with the radius ' $a$ ' from a piece of square shaped sheet. The length of one side of the sheet is ' $2a$ '.

(i) Find the arc length of one sector in terms of ' $a$ '.

(02 Marks)

(ii) Find the perimeter of the shaded portion in terms of ' $a$ '

(04 Marks)



(iii) If the perimeter of the shaded portion is 50 cm, build an equation using the answer in part (ii).

(02 Marks)

(iv) By solving that equation, calculate the value of ' $a$ '.

(02 Marks)

03. A person who borrowed Rs. 50 000 from a finance company at 15% annual simple interest rate, paid back the loan with the interest after 2 years.

(i) Calculate the interest that should be paid for one year. (02 Marks)

(ii) What is the total amount to be paid after two years. (03 Marks)

(iii) To pay the above loan, he sold an item which was owned by him, for Rs. 65 000 keeping a profit of 50%. Find the buying price of that item. (03 Marks)

(iv) How much will remain with him after repaying the loan? (02 Marks)

04. (a) According to the data given in the Venn diagram,

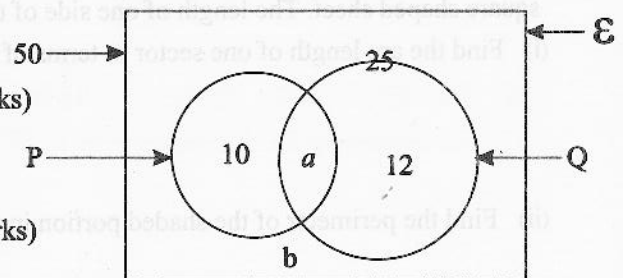
(i) Find the value of 'a' (02 Marks)

(ii) Find the value of 'b'.

(iii) Find  $n(P' \cap Q)$ .

(02 Marks)

(02 Marks)



(b) A and B are 2 sets.  $n(A) = 12$ ,  $n(B) = 8$  and  $n(A \cup B) = 20$

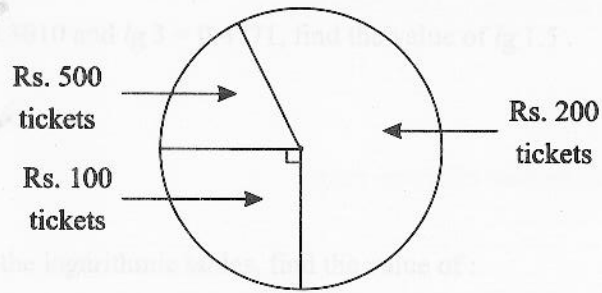
(i) Find  $n(A \cap B)$ .

(ii) What is the special name that can be given for these 2 sets?

(02 Marks)

(02 Marks)

05. The tickets printed for a drama were valued at Rs. 500, Rs. 200 and Rs. 100, The following pie chart illustrates the number of tickets of each type that was sold.



**REFERENCE  
ONLY**

- (i) Of what value were the tickets that were sold the most? (01 Mark)
- (ii) Give the number of Rs. 100 tickets sold as a fraction of the total number of tickets sold. (02 Marks)
- (iii) The number of Rs. 500 tickets sold was 140. If the angle at the centre of the sector that denotes the number of Rs. 500 tickets sold is  $70^\circ$ , find the number of Rs. 200 tickets sold. (03 Marks)
- (iv) Find the total income received by selling the tickets. (04 Marks)

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Mathematics - II

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Grade 10

Paper II

3 Hours

- Answer 10 questions selecting 5 questions from Part A and 5 questions from Part B.
- Each question carries 10 marks.
- If the area of circle with the radius  $r$  is  $A$ ,  $A = \pi r^2$
- If the circumference of a circle with the radius  $r$  is  $C$ ,  $C = 2\pi r$

Part A

01. (a) Customs duty of 12% of the value of the item has to be paid when a certain type of clock is imported. How much has to be paid for customs duty when this type of clock costing Rs. 12 000 is imported? (03 Marks)
- (b) The annual assessed value of a house is Rs. 50 000. An annual tax rate of 6% is charged for it.
- (i) Find the annual assessment tax for the house. (04 Marks)
- (ii) Find the tax that has to be paid for a quarter. (03 Marks)
02. An incomplete table prepared to draw the graph for the function  $y = -x^2 + 4$  is given below.

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

- (i) Fill in the blanks of the table. (02 Marks)
- (ii) Using the scale of 10 small divisions as one unit along the  $x$  - axis and along the  $y$  - axis, draw the graph of the above function on a graph paper. (03 Marks)
- (iii) Using the graph,
- (a) Write the equation of axis of symmetry. (01 Mark)
- (b) Write the positive value of  $x$  when  $y = 2$ . (01 Mark)
- (c) Write the range of values of  $x$  where the function is positive. (01 Mark)
- (d) Find the value of  $\sqrt{7}$ . (02 Marks)
03. (a) Solve
- (i)  $7x - 5 = 23$  (02 Marks)
- (ii)  $x + 2y = -2$   
 $3x - y = 22$  (04 Marks)
- (b) (i) B has got 5 rupees less than the twice of money that A has got. If A gives 20 rupees to B, the amount of money that B has got becomes 135 rupees. If the amount of money that A has got at the beginning is ' $x$ ' rupees, write the amount of money that B has got at the beginning in terms of ' $x$ '. (01 Mark)
- (ii) Using the knowledge of equations, find the amount of money that B has got at the beginning. (03 Marks)



04. The length of a cuboid shaped domestic water tank is 2 m and the breadth is  $1\frac{1}{2}$  m and the height is 1 m. On an occasion when the tank was completely filled with water, it took 60 minutes to empty the tank completely by a pipe.

Find the rate at which water flowed out through the pipe. (Assume that the water flowed through the pipe uniformly) (10 Marks)

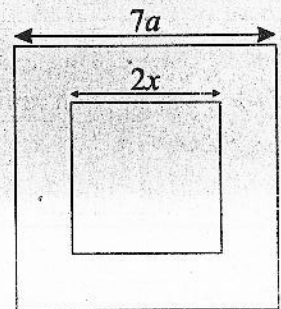
05. (a) The figure shows two squares. The length of one side of the large square is  $7a$  units while the length of the small square is  $2x$  units.

(i) Find the area of the small square in terms of 'x'. (03 Marks)

(ii) Find the area of the large square in terms of 'a'. (03 Marks)

(iii) Show that the area of the large square is larger than the area of the small square in  $(7a + 2x)(7a - 2x)$  square units.

(04 Marks)



06. An algebraic expression has been obtained by adding a certain number to  $x$ . The second algebraic expression has been obtained by subtracting another number from  $x$ . If the product of these two algebraic expressions can be given by  $x^2 - 2x - 63$ , find the number added to  $x$  and subtracted from  $x$ .

(10 Marks)

### Part B

07. If the common term of a certain number pattern is  $2n + 3$ ,

(i) Write down the first four terms. (02 Marks)

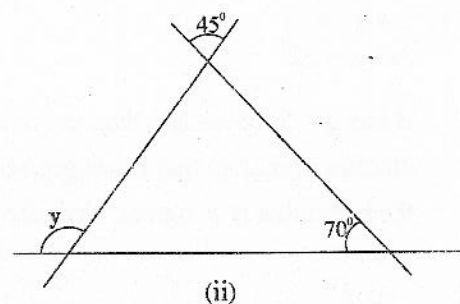
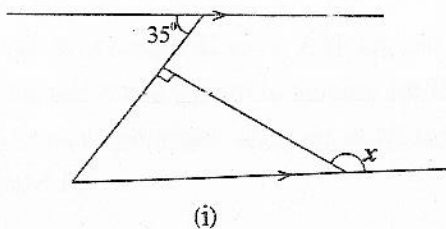
(ii) Find the 10<sup>th</sup> term. (02 Marks)

(iii) Which term is 49? (02 Marks)

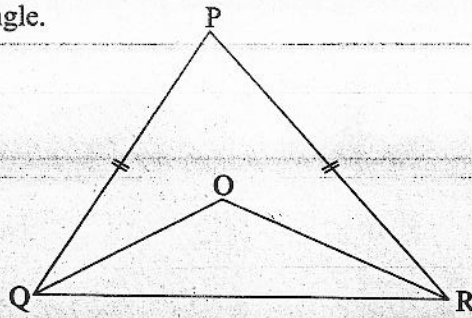
(iv) Find the  $(n+1)$  term. (02 Marks)

(v) Can 154 be a term in this number pattern? Give reasons. (02 Marks)

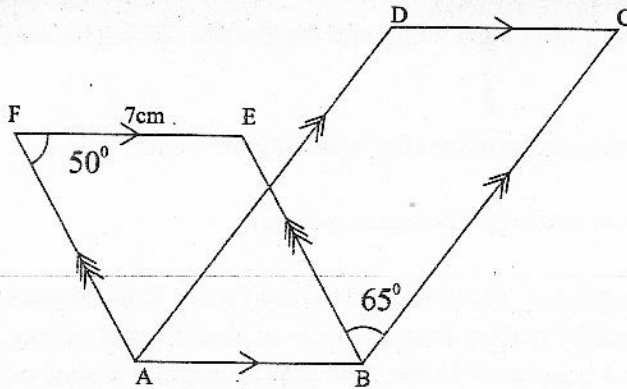
- 08 (a) Find the magnitudes of  $x$  and  $y$ . (04 Marks)



- (b) In the figure given,  $PQ = PR$ . The bisectors of  $\hat{PQR}$  and  $\hat{PRQ}$  meet at the point O. Prove that the triangle QOR is an isosceles triangle. (06 Marks)

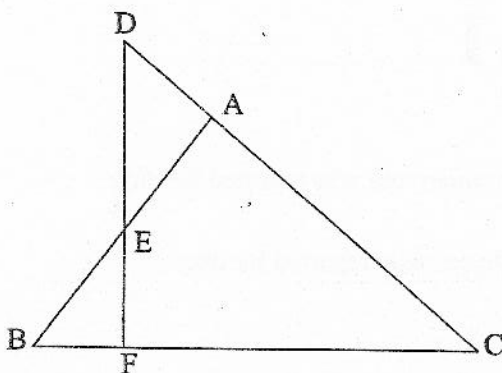


09.



According to the information given in the above figure, find the

- (i) length of DC. (03 Marks)
  - (ii) magnitude of  $\hat{ABE}$ . (02 Marks)
  - (iii) magnitude of  $\hat{ADC}$ . (03 Marks)
  - (iv) magnitude of  $\hat{BCD}$ . (02 Marks)
10. In the triangle ABC,  $AB = AC$ . D lies on the produced side of CA. The straight line drawn from the point D intersects the side AB at the point E and the side BC at the point F such that  $AD = AE$ . Prove that the segment DF is perpendicular to the line BC.



(10 Marks)

11. As shown in Figure A, a circular portion with a radius of 7 cm is removed after cutting from a piece of circular cloth with a diameter of 28 cm. Using such circular portions, a decoration for a border of a saree is prepared as shown in Figure B.

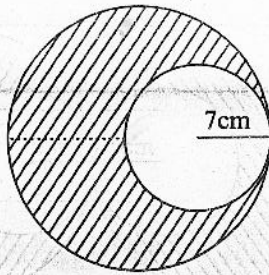


Figure A

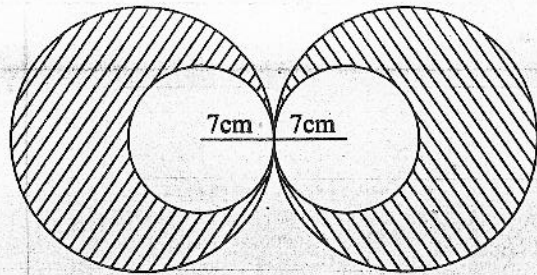
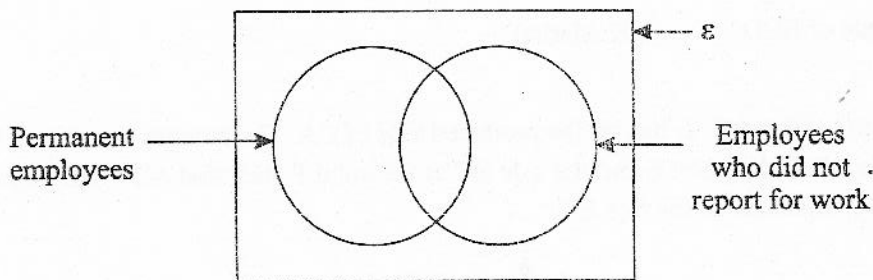


Figure B

- (i) Find the area of the piece of circular cloth with the diameter 28 cm before removing the small circle. (02 Marks)
  - (ii) Find the area of the remaining portion after removing the small circle. (02 Marks)
  - (iii) Find the total area of the shaded portions in Figure B. (02 Marks)
  - (iv) For the border of the saree, 3 decorations as in the Figure B are needed. These decorations are supposed to be prepared by cutting circular pieces of cloth from a rectangular shaped cloth with a length of 100 cm and a breadth of 56 cm. Will that rectangular shaped cloth be sufficient for this purpose? Give reasons. (04 Marks)
12. (i) The total number of employees in an institute is 60. Out of them, 36 are permanent employees. The number of employees who did not report for duty on a certain day is 14. The number of permanent employees who did not report for duty on that particular day is 10. Copy the Venn diagram given below and include the information given. (04 Marks)



- (ii) Shade the area which represents the employees who reported for duty. (02 Marks)
- (iii) Find the number of temporary employees who reported for duty. (04 Marks)