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Second Term Test - 2018  
Mathematics

පාසලේ නම : .....

අනුලක්වීමේ අංකය : .....

Time : 2 Hrs

Part A

- Answer all questions in the paper itself.

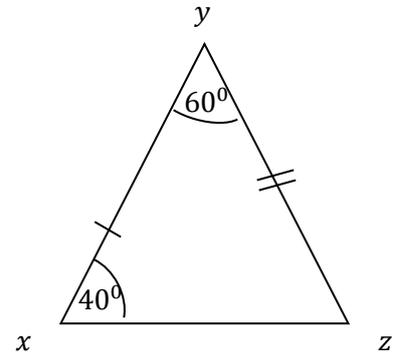
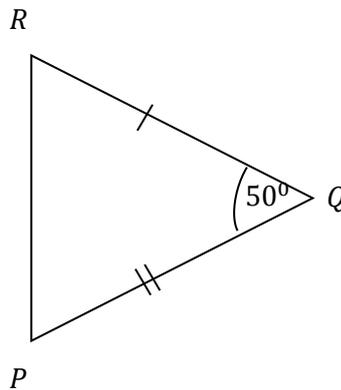
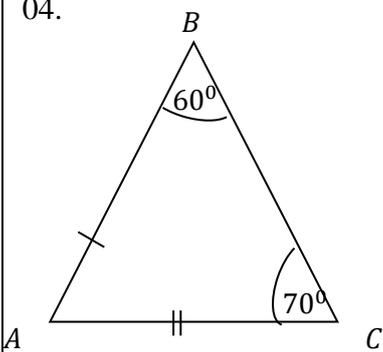
01. Select the first approximation of  $\sqrt{21}$

- i. 4.4      ii. 4.5      iii. 4.6

02. Write quadratic expression  $x^2 - 3x + 2$  as a perfect square

03. Find the simple interest that has to be paid for one year on a loan of Rs 20 000 borrowed at an annual simple interest rate of 15%

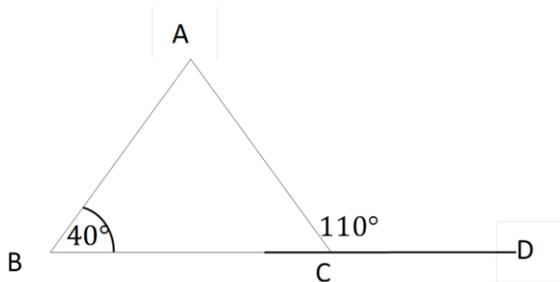
04.



Select and write down a pair of congruent triangles from above given triangles. What is its congruency case?

05. Simplify,  $\frac{1}{2x} + \frac{4}{4x}$

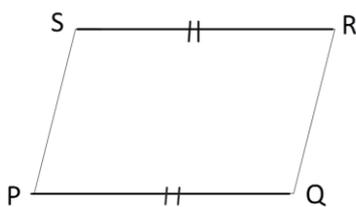
06. According to the information given in the figure, Name two equal sides of triangle ABC



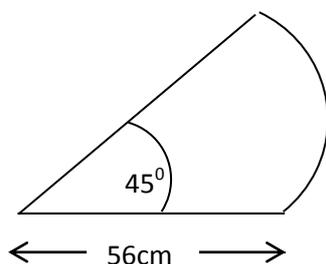
07. It took 8 men 5 days to complete a certain task. How many men are required to complete the task in 4 days?

08. Find the solutions of the quadratic equation,  $(x - 5)(x + 7) = 0$

09. Without the given information, what is the another condition that is satisfied to be the quadrilateral PQRS is a parallelogram.

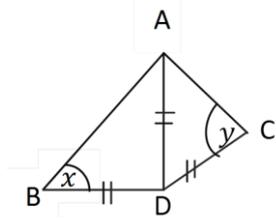


10. Find the arc length of the given sector.



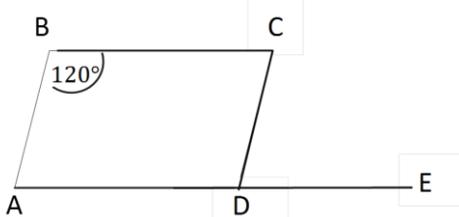
11. Write  $2^7 = 128$  in logarithmic form.

12. Find the magnitude of  $\widehat{BAC}$  in terms of “x” and “y”

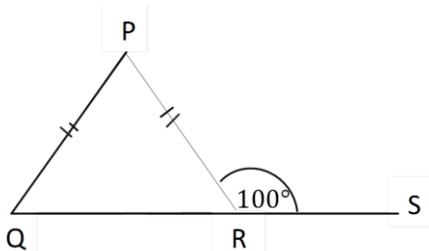


13. Find the L.C.M of  $6xy$  and  $12x^2$

14. Find the magnitude of  $\widehat{CDE}$  of the parallelogram ABCD



15. According to the given information. find the magnitude of  $\widehat{QPR}$ .



16. Solve,  $2x - 5 = 17$

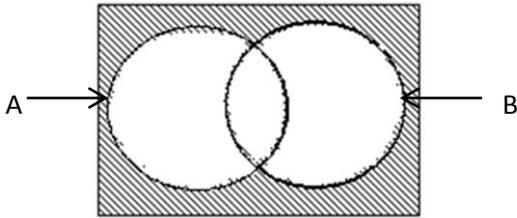
17. The tank is filled by using a pump through which water flows at a uniform rate of 50 litres per minute. If the capacity of the tank is 2000 litres, how many time will it take to fill in the tank completely?

18. Solve the following pairs of simultaneous equations and find the value of "x" .

$$2x - y = 1$$

$$3x + y = 9$$

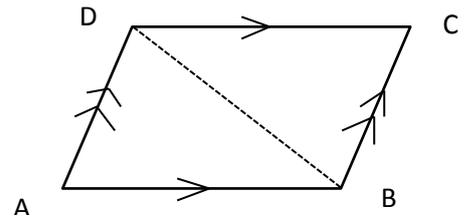
19. Write down shaded region using set notation.



20. Suddenly Nimal who kept  $\frac{3}{8}$  of his salary as the rest of the hand (as balance), had to spend  $\frac{1}{3}$  of it. After that, what fraction of the whole salary remained to him?

21. Factorize,  $4x^2 + 2x + 6x + 3$

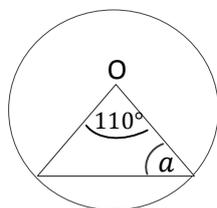
22. If the area of the triangle ABD which is given in the figure, is  $12\text{cm}^2$ , find the area of the parallelogram ABCD



23. Find the gradient of the straight line which passes through (0,5) and (2,13)

24. If Kamal uses 6 hours for his studies, find the angle at the centre of the sector which denotes it in a pie chart.

25. According to the information given in the following figure, find the value of 'a'. "O" is the centre of the circle.

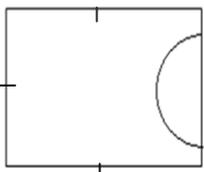


## Part B

- Answer all the questions on the paper itself.

01.  $\frac{3}{4}$  of a household water tank was filled with water. When the water was used up,  $\frac{1}{2}$  of the tank was remained.
- i. What fraction of the whole tank was the used water? (03 marks)
- ii. If the amount of used water is 500l, find the capacity of the tank. (02 marks)
- iii. Find the amount of remained water in the tank is litres. (02 marks)
- iv. If a pipe which water flows at a uniform rate, took 20 minutes to fill the tank completely, how long will it take to fill the amount of water which is equal to the amount of used water to the tank. (03 marks)

02. According to the given diagram, flowers were planted in the semi-circular part which is in the square shaped plot of land. Grass was cultivated in the remaining part.



- i. The length of an iron thread which was used to build a fence around the land, is 104m, Find the length of the side of the plot of land. (01 mark)
- ii. Find the area of the square shaped plot of land. (01 mark)

- iii. The length of the curved boundary of the part which was used to plant the flowers, is 22m, Find the length of its straight boundary. (03 marks)
- iv. Find the area of the part which was used to plant the flowers. (02 marks)
- v. If Rs 200 was given to cultivate the grasses in  $1m^2$ , find the total cost for the cultivating grasses. (03 marks)

03. a) The monthly income of Mr. Pranandu is Rs 60 000.

- i. Find his annual income. (01 mark)
- ii. If first Rs 500 000 is tax free income from the annual income, find the taxable income of Mr. Pranandu . (02 marks)
- iii. If the annual income tax rate is 4%, How much should he pay as income tax. (02 marks)

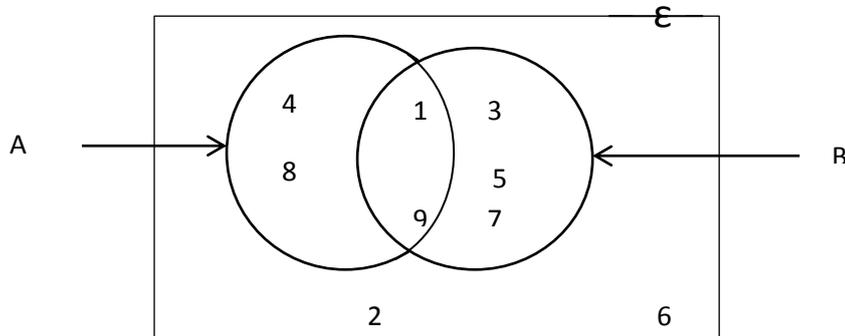
b) A person borrowed a loan of Rs.56 000 at an annual simple interest rate of 12%.After a certain period of time he settled the loan by paying the total amount of Rs. 76 160.

- i) How much interest did he pay for the loan. (02 marks)
- ii) Calculate the interest for a year. (02 marks)

iii) Find the time period of the loan.

(02 marks)

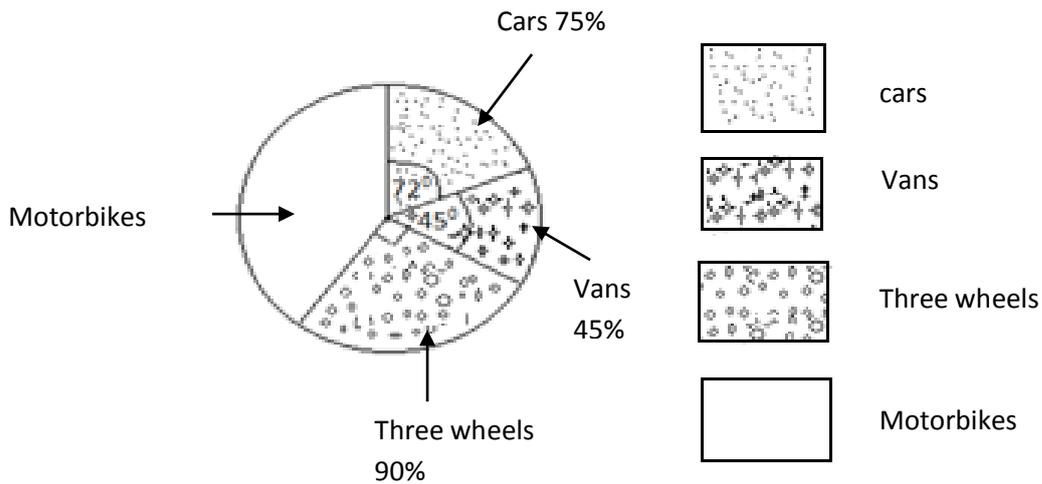
04.



According to the information given in the Venn diagram,

- i. Describe set B using the descriptive method. (01 mark)
- ii. List out the elements of the universal set. (02 marks)
- iii. Shade the region  $A' \cap B'$  in the above Venn diagram. (01 mark)
- iv. Write down the region  $\{6, 2\}$  using the set notation. (02 marks)
- v. According to the information given in the above Venn diagram, verify the formula  $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ . (04 marks)

05. The pie chart given in the figure shows the number of vehicles which were stopped in a vehicle park of an urban council on one day.



- i. Find the magnitude of the angle at the centre of the sector that represents the number of motorbikes. (02 marks)
- ii. If the number of three wheels which were stopped in the vehicle park on that day, is 30, find the number of motorbikes which were stopped. (03 marks)
- iii. Express the number of cars which were came to the vehicle park as a fraction of the total number of vehicles which were came to the vertical park on that day. (02 marks)
- iv. If Rs 20 and Rs 30 is charged for a motorbike and other vehicles which are stopped in the vehicle park, respectively. Find the total income gained by the urban council on that day. (03 marks)



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Second Term Test - 2018  
 Mathematics II

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Time : 03 Hrs

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- Answer ten questions selecting five questions from part A and five questions from part B.
- Each question carries 10 marks.

Part A

01.a) An incomplete table of values prepared to draw the graph of the function  $y = 3 - x^2$  is given below.

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

i. Copy the above table and fill in the blanks of it and then draw the graph of the above function on a graph paper by using a suitable scale. (02 marks)

b) Answer the following questions using the graph.

i. Write down the equation of the axis of symmetry of the graph. (02 marks)

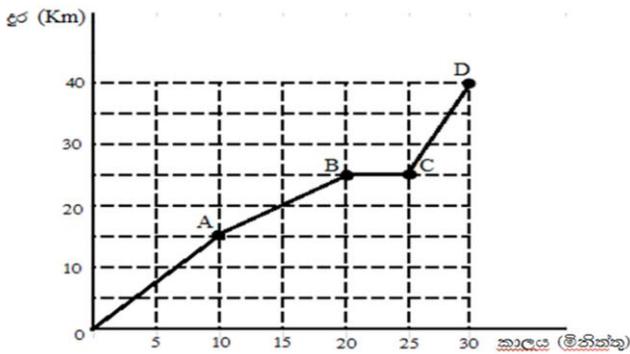
ii. Write down the maximum value of the function. (02 marks)

iii. Find the value of  $x$ , when  $y = -1$  (02 marks)

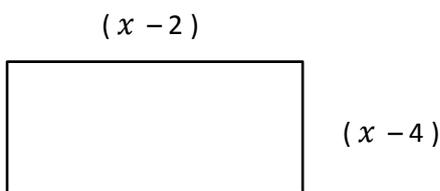
iv. Find the positive root of the equation  $3 - x^2 = 0$  using the graph. (02 marks)

02. The assessed annual value of a house of a certain urban council is Rs 50 000/= and the owner of the house has rented it. The monthly rent charged is Rs.1000. 25% of the annual rent was spent on maintenance. If  $\frac{1}{15}$  of the remained amount was paid as rate, find percentage that the urban council charges as rates. (10 marks)

03. A distance time graph of the motion of a man who travels from his home to the office on his motorcycle is given below.



- i. How far is it from his home to the office? (01 mark)
  - ii. How long did it take him to reach the office? (01 mark)
  - iii. Calculate his average speed. (03 marks)
  - iv. Describe his motion from B to C. (02 marks)
  - v. Calculate the speed at which he travelled first 15km. (03 marks)
- 
04. a) Solve,  $\frac{x+1}{3} - 1 = 5$  (03 marks)
- b) 'a' and 'b' are two numbers. Five times 'a' is two more than two times 'b'. When 'b' is added to the three times 'a', The answer is 10.
- i. Construct a pair of simultaneous equations in terms of 'a' and 'b'.
  - ii. Solve the pair of simultaneous equations and find separately the value of 'a' and 'b' (07 marks)
- 
05. i. Expand,  $(x + \frac{1}{2x})^2$  (02 marks)
- ii. Find the LCM of  $x^2 + 6x + 8$  and  $x^2 - 16$  (04 marks)
- iii. Simplify,  $\frac{2}{x^2+6x+8} + \frac{3}{x^2-16}$  (04 marks)
- 
06. The area of the rectangular sheet given below is  $48\text{cm}^2$ .

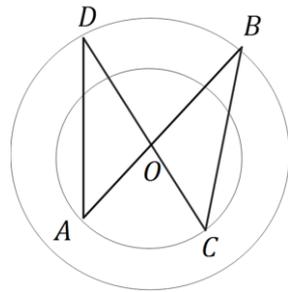


- i. Write an equation for the area of the sheet and show that it can be written as  $x^2 - 6x - 40$ . (03 marks)
- ii. Solve the quadratic equation and by considering the positive value find the length and breadth of the rectangular sheet. (07 marks)

Part B

07. It engages 125 female workers at 8 hours per day by a factory to complete an order of garments which should be handed over within 20 days .After 4 days because of 25 female workers were recruited for another branch, how many extra hours per day should be worked by remained female workers to complete the task on scheduled date. If Rs.120 is paid for an extra hour, find the total amount should be spend for extra hours. ( 10 marks )

08. a)



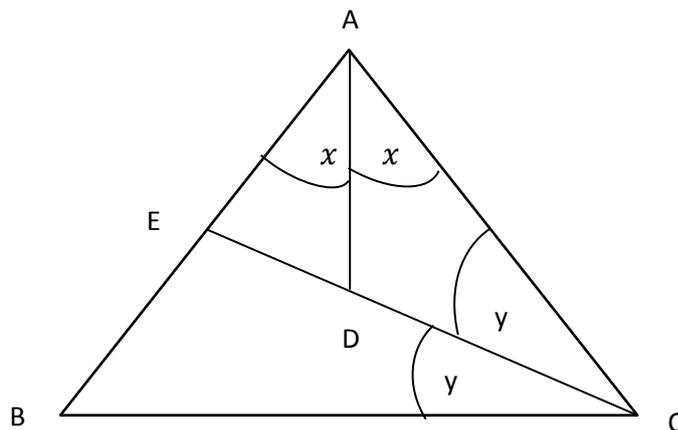
The diagram shows two concentric circles of centre “O”.Fill the following blanks to congruent the triangles AOD and BOC.

In triangles AOD and BOC,

- DO = BO ( radius of the large circle )  
 AO = ..... (radius of the small circle) ( 01 mark )  
 $\widehat{AOD} = \widehat{BOC}$  (.....) ( 01 mark )  
 $\Delta AOD \equiv \Delta BOC$  (.....) (01 marks)

b) According to the information given in the figure,

- i. Find the value of  $x + y$  ( 02 marks )  
 ii. Find the magnitude of  $\widehat{ADE}$  (01 mark)  
 iii. If  $x = 30^\circ$ , find the value of  $y$ . (01 mark)  
 iv. Prove that  $AE = AD$  (03 marks)

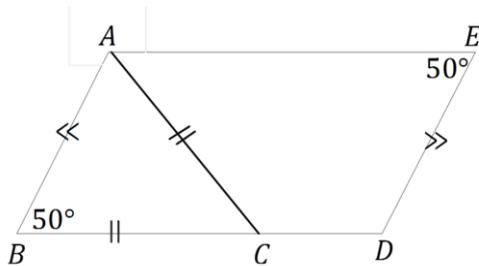


09. a) Out of 100 students in a class asked about their preference about two subjects Mathematics and science.  $x$  Prefer both two subjects, 50 prefer for Mathematics and 30 prefer only for science. The number of students those who do not prefer any of these two subjects is twice the number of students those who prefer both of these two subjects. Represent this information in a Venn diagram and find the value of  $x$ . (04 marks)

- b) Simplify using the logarithms table.

$$A = \frac{24.25 \times 2.89}{13.25} \quad (06 \text{ marks})$$

10. In triangle ABC,  $AC = BC$ . BC is produced to D and the line drawn parallel to BA from D meets the line drawn from A at E.  $\hat{A}BC = \hat{A}ED = 50^\circ$

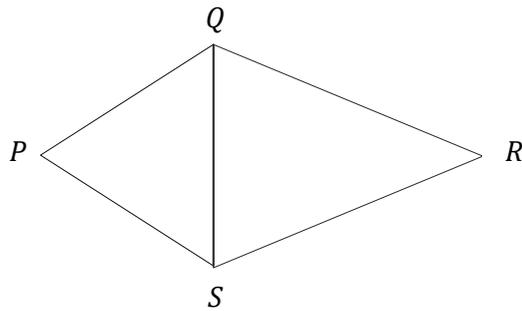


- i. Copy the sketch of the above diagram in your answer sheet and find the magnitude of the following angles by giving reasons.

- a)  $\hat{B}AC$  (02 marks)  
 b)  $\hat{A}CD$  (02 marks)  
 c)  $\hat{B}DE$  (02 marks)  
 d)  $\hat{C}AE$  (02 marks)

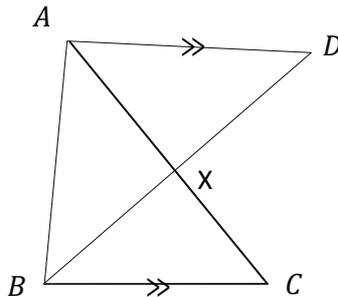
- ii. Is ABDE a parallelogram or not? Give reasons. (02 marks)

11. In the triangle PQS given in the figure,  $PQ = PS$ . In the triangle SRQ,  $QR = SR$



- i. Include the above information in the figure. ( 01 mark )
- ii. Prove that  $\widehat{PQR} = \widehat{PSR}$ . ( 03 marks )
- iii. Prove that  $PR$  is perpendicular to  $QS$ . ( 06 marks )

12. In the figure, the bisector of  $\widehat{ABC}$  is  $BD$  and the bisector of  $\widehat{BAD}$  is  $AC$ .  $AC$  and  $BD$  meet at the point  $X$ .



- i. Prove that  $ABC$  is an isosceles triangle.
- ii. Prove that  $\triangle ABX \cong \triangle ADX$
- iii. If  $AX = XC$ , prove that  $ABCD$  is a parallelogram.