

සියලු ම හිමිකම් ඇවිරිණි  
All Rights Reserved

දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව  
Department of Education, Southern Province  
දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව  
Department of Education, Southern Province  
දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව  
Department of Education, Southern Province  
දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව  
Department of Education, Southern Province

අවසාන වාර පරීක්ෂණය - 2019  
Year End Term Test - 2019

10 ශ්‍රේණිය  
Grade 10

Mathematics - I

පැය දෙකයි  
Two hours

- Answer all questions on this question paper itself.
- 2 marks for each question in part A.

Part A

01. A bus travels 124 km within 2 hours. Find it's speed in kilometers per hour.

02. Factorize  $x^2 - 5x + 6$

03.  $\sqrt{x} = 5.1$  underline the suitable value for x.

(i) 19

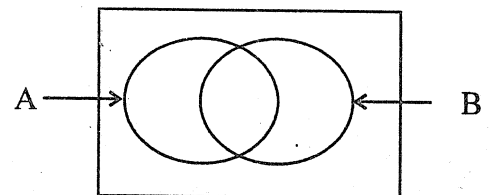
(ii) 26

(iii) 35

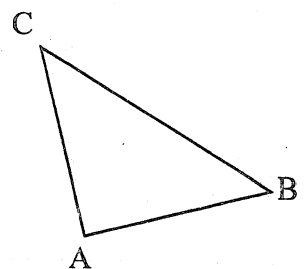
04. Simplify

$$\frac{3}{x} + \frac{1}{3x}$$

05. Shade the region which represent  $A \cap B$  in the Venn diagram

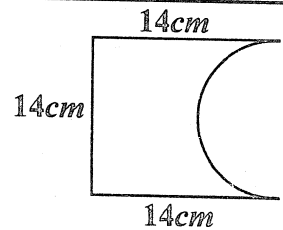


06. In the given ABC triangle  $\hat{A} = 2\hat{B}$  and  $\hat{B} = \hat{C}$ . Find the value of  $\hat{A}$



07. Express  $5^0 = 1$  in logarithm form.

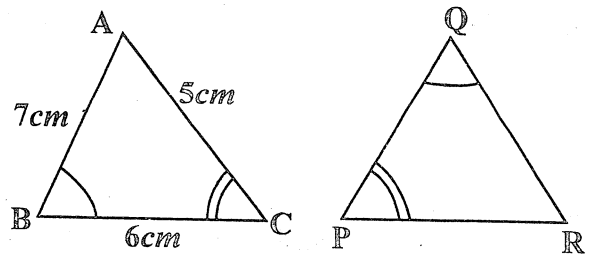
08. Find the perimeter of this figure which contains a semi circular sector.



09. A man borrowed Rs. 50 000 at an annual simple interest rate of 12%. Find the interest he has to pay at the end of a year.

10. Find the least common multiple of the algebraic expressions  $3p^2q$  and  $12q^2$

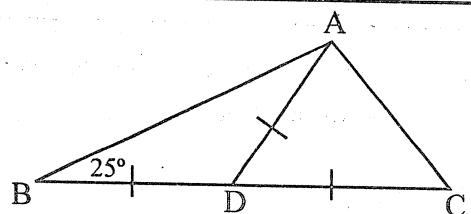
11. Triangles ABC and PQR are congruent. Using the given data find the lengths of the sides PQ, QR and PR.



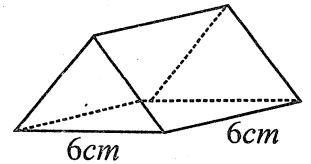
12. It is estimated that 144 man days are required to complete a certain task. How many men needed to complete this task within 24 days.

13. Solve  $(2x - 1)(x + 1) = 0$

14. Using the data in the figure. Find the value of  $\hat{BAC}$ .

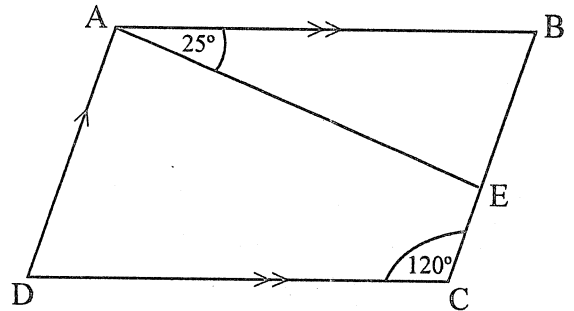


15. Draw sketches of 2 different faces with measurements of the below right equilateral triangular prism.



16. Write down suitable values for the blanks.  
Equation of a straight line is given by  $2y = 4x - 6$ . It's gradient is ..... and the intercept is .....

17. ABCD is a parallelogram. Using the given data in the figure, find the value of  $\hat{DAE}$ .

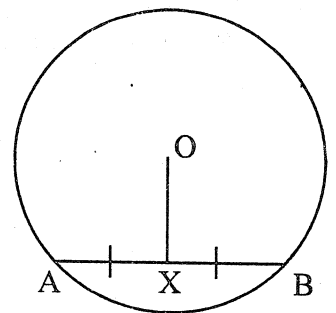


18. 1, 2, 3 are marked on the opposite faces of a fair cube shaped dice. If the fair dice is rolled once, Find the probability of getting an even number.

19. If the volume of a right circular cylinder of height 10 cm is  $1540 \text{ cm}^3$ . Find the base radius of the cylinder.

(Volume of a cylinder of height  $h$  and base radius  $r$  is  $\pi r^2 h$ ,  $\pi = \frac{22}{7}$ )

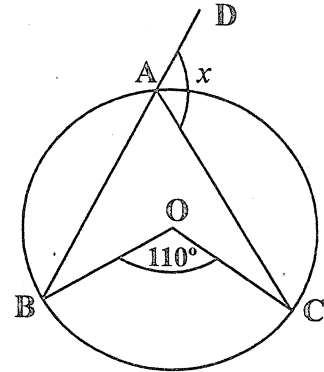
20. O is the centre of the circle and X is the mid point of the chord AB. Find the value of  $\hat{AXO}$ .



21. Below statements are regarding the given frequency distribution. If the statements are correct put a (✓) and if incorrect put (\*). 12 - 18, 19 - 25, 26 - 32, 33 - 39, 40 - 46, 47 - 63

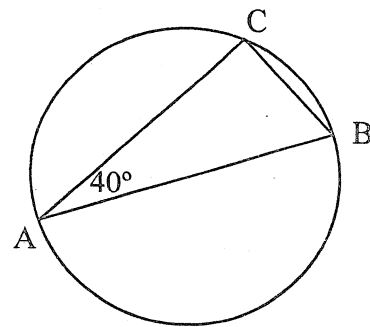
Class size of the distribution is 6	
Mid value of 26-32 class interval is 29	

22. O is the centre of the circle. Based on the given data in the figure find the value of  $x$ .

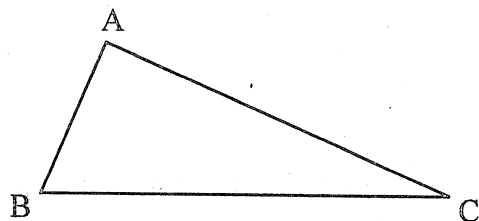


23. Write down the set of positive intergral solutions of the inequality.  $3x - 2 \leq 1$

24. AB is a diameter of the circle. Using the given data find the value of  $\hat{A}BC$ .



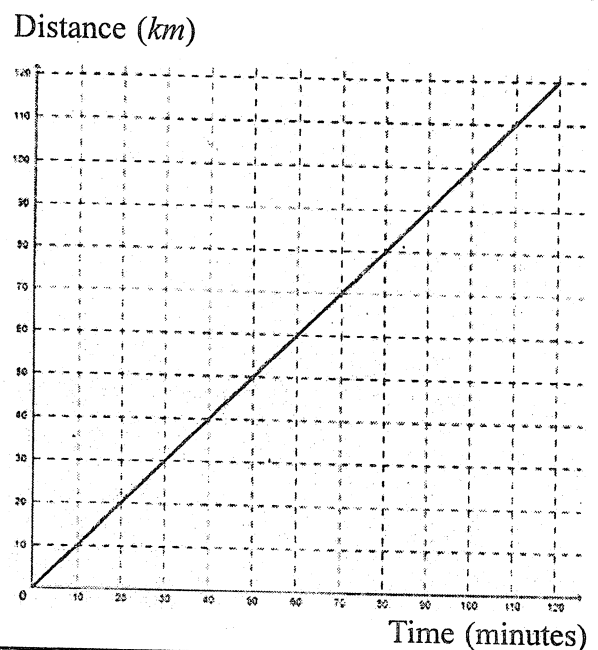
25. Draw a sketh of the construction lines to find the point "P" which is moving equidistance from AB and AC sides and on the side BC.



## Part B

- (01)  $\frac{1}{9}$  of those who participated to get the vehicle licence fail the written test.  $\frac{1}{18}$  of those who participated to get the vehicle licence fail the medical test.
- (i) Express those who fail the written and medical tests as a fraction. (02 marks)
- (ii) From the remaining  $\frac{4}{5}$  passed the practical test. Express that amount as a fraction of the total amount. (02 marks)
- (iii) If 20 failed the practical test find the total number of people who participated to get the vehicle licence at the beginning. (03 marks)
- (iv) How many people are there who are unable to get the vehicle licence (03 marks)

- (02) The below graph shows how Sugath travelled in the express way by his car in a uniform speed starting from a certain expressway entrance to another expressway exit.



---

(i) Find the total distance he travelled. (01 mark)

(ii) Find the speed of the vehicle in kilometers per hour. (02 marks)

(iii) After 20 minutes Naleem travelled the same distance at a speed of 100 kilometers per hour by his car. Represent the way Naleem travelled on the above graph itself. (03 marks)

(iv) Find the time Naleem took to complete the journey. (02 marks)

(v) Naleem passed Sugath at a certain place. Find the distance to that place from the starting point. (02 marks)

---

(03) (a) The assessed annual value of a house is Rs. 65 000. The annual rates percentage is 8%. Find the rates for a quarter for that house. (04 marks)

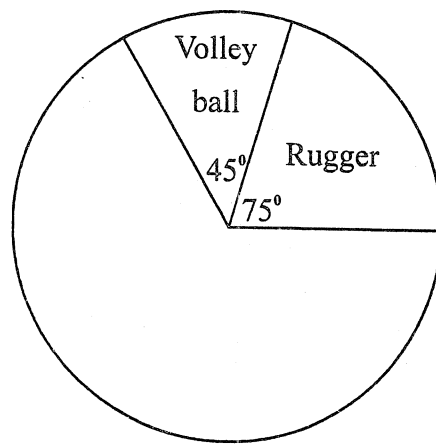
(b) Owner of the above house rented the house. The rental per month for the house is Rs. 12 000. He took the advance for a year and deposited that amount in a bank.

(i) Find the amount the owner deposited in the bank. (02 marks)

- 
- (ii) From the interest he received at the end of a year he paid the annual rates for this house. Then he remains Rs. 12 080. Find the annual simple interest rate.  
(04 marks)

---

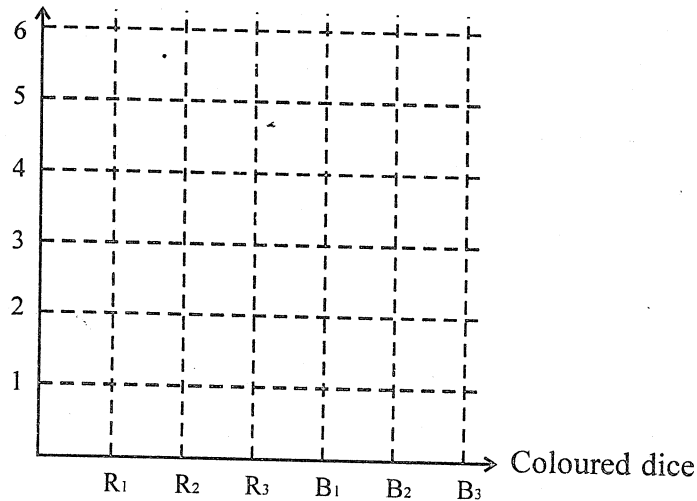
(04) This pie chart shows how the students in the sports club of a certain school select cricket, football, volley ball and rugger as their sport. Each student selected only one sport. Three times the students who selected foot ball selected cricket.



- (i) Find the angle at the centre of the sector which represent the students who selected foot ball.(02 marks)
- (ii) Represent the students who selected foot ball and cricket in this pie chart and include the relevant data in it. (03 marks)
- (iii) If 30 students selected volleyball how many students selected cricket. (02 marks)
- (iv) How many students in total are in this sports club. (03 marks)

- (05) Amila engaged in a certain dice game. For that he use 2 fair dice. In one dice 3 faces are coloured in red and the remaining 3 faces are coloured in blue. In the other dice 6 faces are numbered from 1 to 6.

Numbered dice

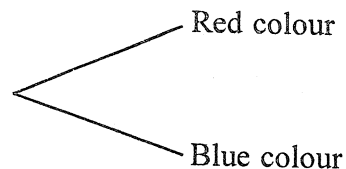


- (i) Amila rolled both dice. Represent the sample space in the given grid. (Here the red coloured faces represented by  $R_1, R_2, R_3$  and the blue coloured face represented by  $B_1, B_2, B_3$ ) (02 marks)

- (ii) Encircle the event in the grid getting red colour with a number greater than 4 and find its probability. (02 marks)

He expect to get an odd number in the numbered dice and engaged in this game,

- (iii) For that extend the below tree diagram and write down the probabilities. (03 marks)



- (iv) Using the above tree diagram, find the probability of getting an odd number. (02 marks)

(02 marks)



- Answer 5 questions from part A and 5 questions from Part B.
- The volume of a right circular cylinder of base radius  $r$  and height  $h$  is  $\pi r^2 h$  and curved surface area is  $2 \pi r h$ . (Here  $\pi = \frac{22}{7}$ )

Part A

(01) A person imported a vehicle. As the customs duty he has to pay 30% of the imported value and 15% as the value added tax (VAT). After paying all the above taxes he has to pay Rs. 18 000 as the loaded, unloaded and transportation costs. For the vehicle in total he paid Rs 5 400 000. When he imported the vehicle he paid for the vehicle in American Dollars and at that day an American Dollars worth Rs. 180. Show that the imported value of the vehicle is 20 000 American Dollars. (10 marks)

(02) An incomplete table to draw the graph of the function  $y = a - x^2$  is given below.

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

- (i) By considering the symmetry of the given table obtain the value of  $y$  when  $x = 2$  (01 mark)
- (ii) Draw the graph of the above function by taking 10 small divisions along both  $x$  and  $y$  axes as one unit. (03 marks)
- (iii) Using the graph find the value of  $a$ . (02 marks)
- (iv) Write the range of values of  $x$  for which the function is positive. (02 marks)
- (v) Find the value of  $\sqrt{3}$  using the graph. (02 marks)

(03) The below frequency distribution shows the information collected from 30 houses about the water units consumed during a month under the Sath Piyum water distribution project.

Water units	16- 18	18 - 20	20 - 22	22 - 24	24 - 26	26 - 28
Number of houses (frequency $f$ )	2	4	10	8	5	1

- 
- (i) Which class interval contains the highest number of houses. (01 mark)
- (ii) Taking the mid value of the modal class as the assumed mean or any other method find the mean number of water units consumed by a house during a month, for the nearest whole number. (06 marks)
- (iii) The manager of this project stated that they earned Rs. 12 for a water unit from each house. But really they have to pay Rs. 17 for a water unit. Find the extra amount they have to bare for the water units per month from a project with 50 houses. (03 marks)
- 

- (04) (a) Solve the inequality  $5 - 2x < 1$  and represent the solutions on a number line. (03 marks)
- (b) Simplify  $\frac{2}{x-1} + \frac{1}{1-x}$  (02 marks)
- (c) Solve  $3x + 2y = 0$   
 $x - y = 5$  (05 marks)
- 

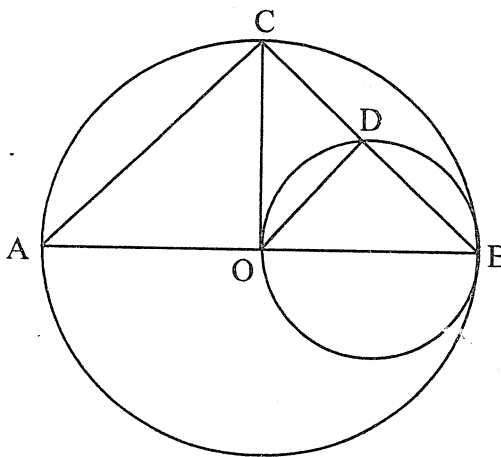
- (05) There are two pumps which provides water to a certain tank in a uniform speed. One pump takes 5 minutes more than the other pump to fill the empty tank completely. Using the both pumps the tank completely filled within 6 minutes. By taking the time taken by the pump with high speed to fill the tank completely as  $x$  minutes, show that the value of  $x$  is given by  $x^2 - 7x - 30 = 0$  and by solving it find the value of  $x$ . (10 marks)
- 

- (06) (a) The distance between two towns in a map draw to the scale 1:50 000 is 20 cm.
- (i) Find the actual distance represented by 1 cm in the to map. (01 mark)
- (ii) Find the actual distance between 2 towns in kilometres. (02 marks)
- (b) The angle of elevation of the top of a flag post observed from the bottom of a building is  $60^\circ$ . Angle of depression of the top of the same flag post observed from a window which is 10 m away from the bottom of that building is  $45^\circ$ .
- (i) Draw a scale diagram by representing 2 m of actual length by 1 cm in the scale diagram. (04 marks)
- (ii) Using it find the height of the flag post in meters. (03 marks)
-

- (07) 1<sup>st</sup> term is 5 and the 25<sup>th</sup> term is 25 in an arithmetic progression.
- (i) Find the common difference. (03 marks)
  - (ii) Find the 17<sup>th</sup> term. (02 marks)
  - (iii) Find the sum of the first 20 terms. (03 marks)
  - (iv) Write the common difference of the arithmetic progression which is formed by adding 3 to every term of the above arithmetic progression. (02 marks)

- (08) (i) Constructs the triangle PQR such that  $PQ = 6\text{cm}$ ,  $QR = 9\text{cm}$  and  $\hat{QPR} = 90^\circ$  (04 marks)
- (ii) Construct the bisector of  $\hat{PRQ}$ . Name the intersection point of that bisector and PQ side as S. (02 marks)
- (iii) Name the point which is on SR and moving equidistance from the points S and R as O. (02 marks)
- (iv) Construct the circle by taking O as the centre and OP as the radius and write down the radius of that circle. (02 marks)

- (09) The centre of a circle is O and the diameter of the other circle is OB. If  $\hat{ABC} = 45^\circ$ , prove that,



- (i)  $AC \parallel OD$  (03 marks)
- (ii)  $\hat{BOC} = 90^\circ$  (02 marks)
- (iii) D is the centre of the circle which is passes through the points B, O, C. (05 marks)

(10) ABCD is a quadrilateral such that  $AB = AD$ . The base of the perpendicular drawn from A to CD is X. AX and BD are intersect at Y and  $YC = YD$ .

(i) Represent the above information in a figure and prove that  $CXY\Delta \equiv XYD\Delta$  (05 marks)

(ii) Prove that ABC triangle is an isosceles triangle. (05 marks)

(11) (a) Base radius of a cylindrical container is  $r$  and its height is seven times as its base radius. A cube shaped container of side length  $r$  is used to fill water to this cylindrical container. How many times it is needed to pour water from the cube shaped container to fill the cylindrical container completely. (04 marks)

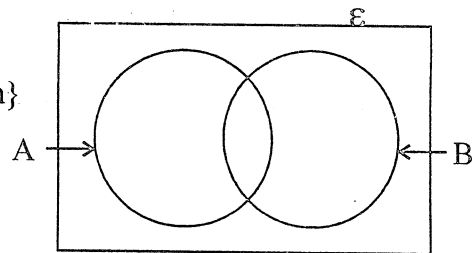
(b) The curved surface area of the above cylinder is  $2150\text{cm}^2$ . Find the value of  $r^2$  to the nearest whole number using logarithms table by taking  $14\pi = 43.96$  and then find the value of  $r$ . (06 marks)

(12) The below information is about 30 students who participated to a Daham Pasal speaking competition.

$\epsilon$  = {students who participated in the competition}

A = {Boys who participated in the competition}

B = {Students who won the competition}



15 boys participated in the above competition and 7 of them won the competition.

13 students lost the competition.

copy the given Venn diagram in your answer sheet,

(i) Include the above data in the Venn diagram (04 marks)

(ii) How many girls won the competition. (02 marks)

(iii) Write down in set notation the region which represent the boys who lost the competition. (02 marks)

(iv) If all the boys who participated in the competition won the competition draw a new Venn diagram to represent it. (02 marks)