

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය 2020 - පෙරහුරු ප්‍රශ්න පත්‍ර  
 General Certificate of Education (Ord Level) Examination 2020 - Model Paper

මාච්ඡා I  
 Mathematics I

මාදුල්ල අධ්‍යාපන කලාපය  
 Zonal Education Galle

විෂය දිගුකාලීන  
 Two Hours

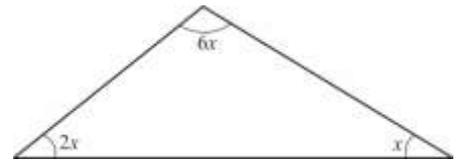
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Part A

Answer all the questions on this paper itself.

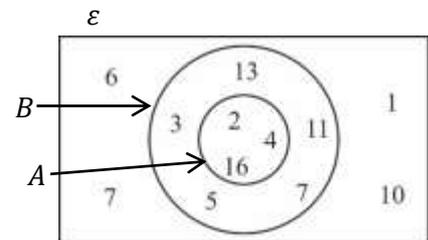
- 01). Between which whole numbers does  $\sqrt{17}$  lie? Underline the correct answer.  
 (i). 17 and 18      (ii). 18 and 19      (iii). 4 and 5      (iv). 4 and 3

- 02). Find the value of x according to the given information.

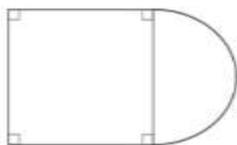


- 03). Find the Highest Common Factor of  $20p^2$ ,  $30pq^2$

- 04). Find  $n(A' \cap B)$  by using the information in the venn diagram.

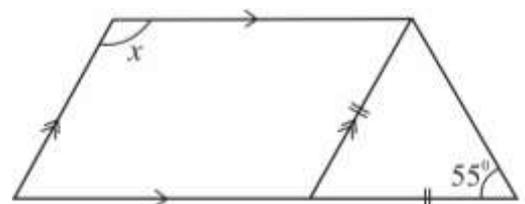


- 05). Find the perimeter of the following figure which is made of a square of 28cm a side and a semicircle.



- 6). Express  $4^0 = 1$  in logarithmic notation.

- 07). Find the value of x according to the given information.



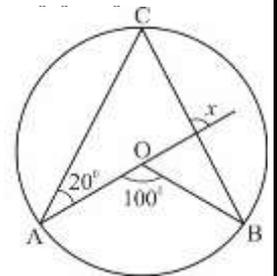
08). It takes 20 men days to complete exact half of a certain work. Find the number of days needed to complete the whole work if 8 men are employed?

09). Factorise.  $4x^2 + 3x - 1$

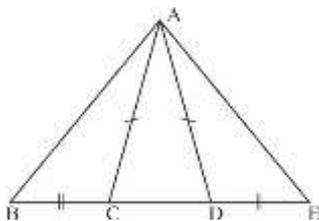
10). If  $A = \begin{pmatrix} 5 & 3 \end{pmatrix}$  and  $B = \begin{pmatrix} 3 \\ 5 \end{pmatrix}$  Find the matrix AB

11). There are 4 equal cards numbered as 1, 2, 3, 4 in a box and 2 equal balls numbered as 3, 4 in a bottle. Find the probability of getting two even numbers when taking a card and a ball randomly?

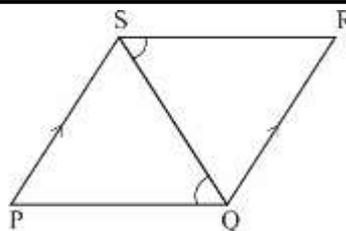
12). The points A, B, C are situated on the circumference of the circle with center O. Find the value of x.



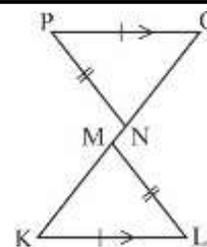
13).



(b)



(c)



(a)

Underline the correct pair of congruent triangles according to the data given in the diagrams.

(i). Only a (ii). Only b and c (iii).only c (iv). Only a and b

14). 960 liters of water is flown through a pipe within 8 minutes. What is the rate of the water flow in liters per second?

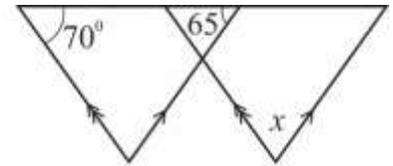
- 15). Following pie chart shows how a set of students participate for 4 games. If 60 students participate for both Elle and Badminton, Find the number of students who play cricket.



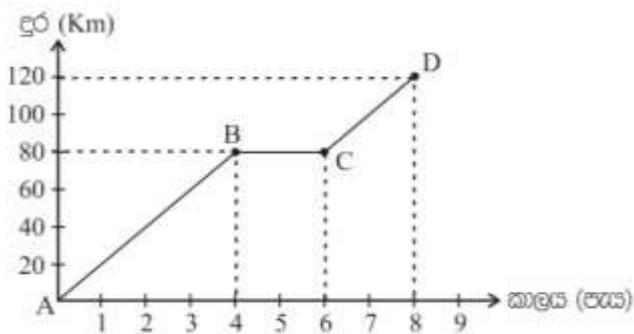
16).  $\frac{5}{x-1} + \frac{4}{1-x}$  Simplify

- 17). What is the annual assessed value of a building in which the building owner pays Rs. 1200 as the quarterly payment for which the local government charges 8% as the rates?

- 18). Find the value of  $x$  according to the given information.

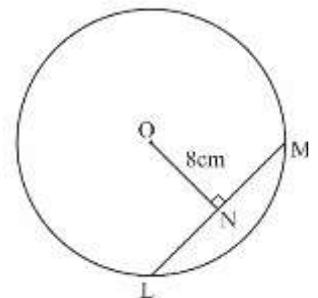


- 19).



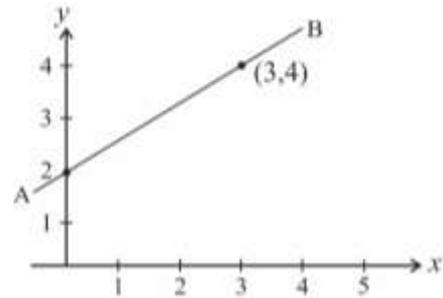
Following is a distance – time graph which shows the motion of a three wheeler. Find the difference between the speed from A to B and that of C to D.

- 20) Following is a circle of center O and diameter 20cm. Find the length of the chord LM.

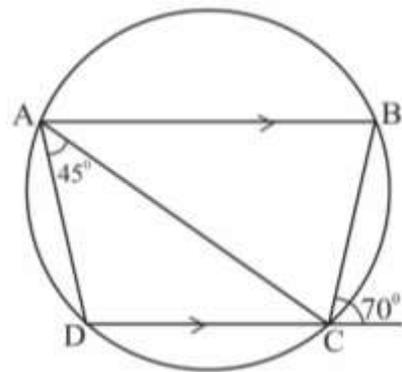


- 21). A man invested Rs. 36000 to buy the shares of Rs. 40 which pays an annual dividend of Rs. 4 per share. What is his annual dividend income?

- 22). Find the gradient of the line AB.

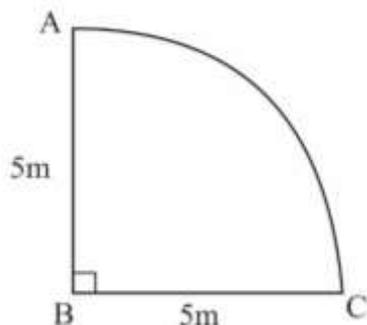


- 23). Find the value of  $\hat{A}CD$



- 24).  $3\frac{1}{2}x = 7$  Solve.

- 25).



Following is a sector shaped flower bed of center B. Find the suitable place and mark on the diagram to plant a plant which is equidistant from the boundaries BA and BC and 5m away from B by using the knowledge of loci.

Part B

Answer all the questions on this paper itself.

01). Health Authorities predict  $\frac{3}{5}$  of the workers of a certain company are Covid - 19 patients. Then 150 workers faced for the PCR test first and  $\frac{1}{3}$  of them are identified as Covid - 19 patients.

i. Express the number of employees who are not predicted as Covid - 19 patients as a fraction of the whole employees. (2 marks)

ii. How many employees are identified as patients from the first PCR test? (2 marks)

During two days, it is revealed that  $\frac{5}{9}$  of the rest are Covid - 19 patients from the second tests. The number of employees who are not affected is 360.

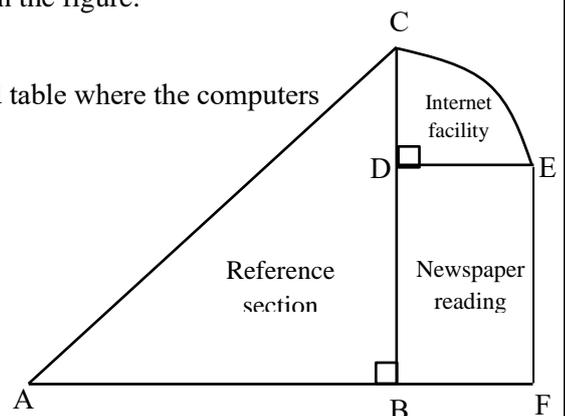
iii. How many employees are reported as patients from the second test? (2 marks)

iv. What fraction of the whole company are patients? (2 marks)

v. Calculate and show that the prediction of the Health Authority is correct. (2 marks)

02). A rough diagram of the floor plan of a library is given in the figure.

i. Calculate the length of the curved edge CE of the round table where the computers are kept in which  $CD = 7\text{m}$  (2 marks)



ii. If the area of the newspaper reading section is  $63\text{m}^2$  find the length of EF. (1 mark)

iii. If  $AB = 12\text{m}$ , find the length of  $AC$  by using the triangle and find the perimeter of the floor of the library. ( 4 marks)

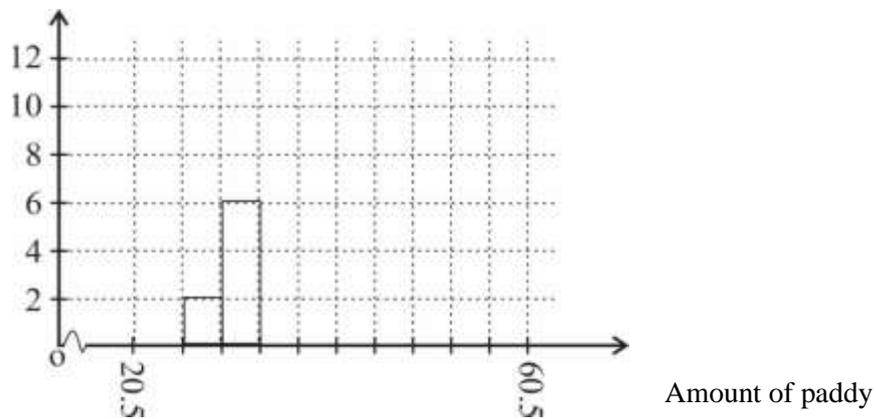
iv. It is decided to lay carpets for the floor of the reference section and that of the computer section. Find the expenditure for that at Rs. 200 per  $1\text{m}^2$  (5 marks)

03) Following table shows the information about the amount of paddy bought at a paddy buying center on certain days.

Amount of paddy bought per day(metric tonnes)	Class interval with boundaries	No. of days
26 -30	25.5 - 30.5	2
31 -35	30.5 - 35.5	.....
36 - 40	.....	11
41 - 50	.....	16
51 - 55	.....	5

i. Complete the column of class interval with boundaries to draw the histogram.(2 marks)

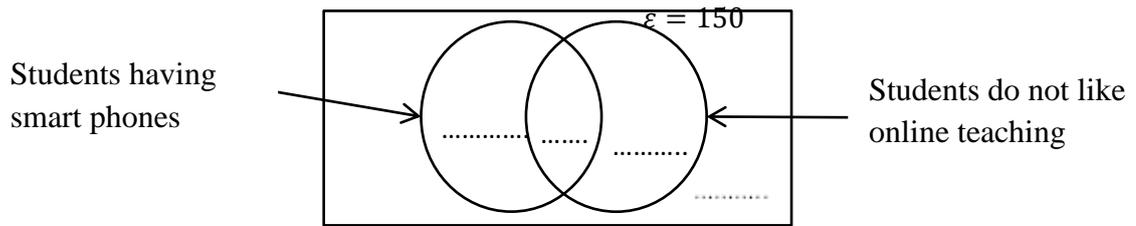
ii. Write the no. of days relevant to the class interval 31 – 35 in the table. (2 marks)



iii. Complete the histogram. (4 marks)

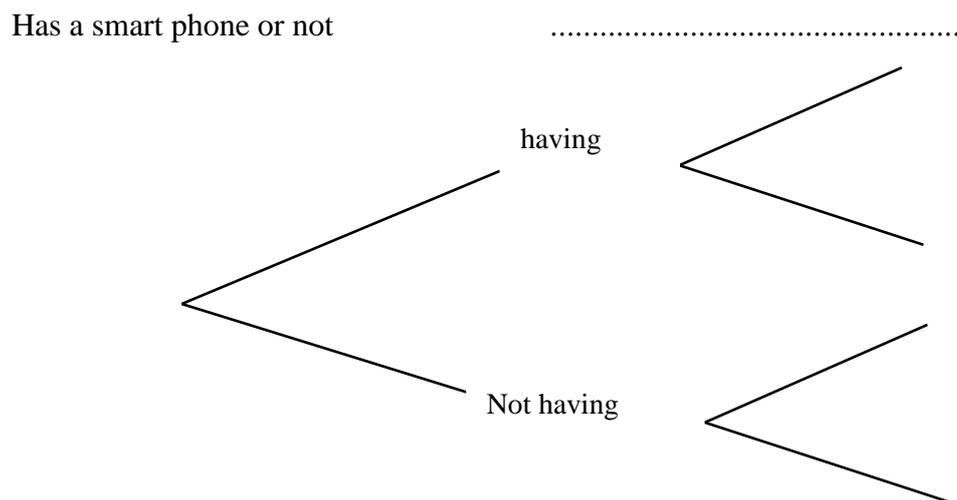
iv. Draw the frequency polygon on the histogram you drawn. (3 marks)

- 04). A teacher inquires about online teaching from 150 students of Grade 11. It is revealed that 100 students have smart phones but 20 of them do not like online teaching and 10 students who do not have smart phones like online teaching. Using the venn diagram given,



- i). Represent the above information in the venn diagram. (4 marks)
- ii). How many students who do not have a smart phone do not like online teaching? (4 marks)

Given below is a part of a tree diagram drawn to represent a randomly selected student has or does not have a smart phone likes online teaching or does not like online teaching.



- iii). Complete the tree diagram by representing all the probabilities and likeness/dislikeness for online teaching. (4 marks)
- iv). Find the probability that a randomly selected student being a student who does not have a smart phone likes online teaching. (1 mark)



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General Certificate of Education (Ord Level) Examination 2020 - Model Paper

විෂයය II  
Mathematics II

භාලුල අධ්‍යාපන කලාපය  
Zonal Education Galle

පැය තුනයි  
Three Hours

1

- ❖ Select 5 questions from Part A and 5 questions from Part B to answer 10 questions.
- ❖ Each question receives 10 marks.
- ❖ The volume of a right cylinder whose radius of base is  $r$  and height  $h$  is  $\pi r^2 h$
- ❖ The volume of a sphere of radius  $r$   $\frac{4}{3} \pi r^3$

**Part A**

01). You can buy a smart phone of Rs. 60000 by using following methods.

You receive 5% discount at outright purchase.

You can pay  $\frac{1}{5}$  of the value first and the balance by 24 months at 12% annual rate of interest under reducing balance.

If Kamal buys a smart phone under reducing balance,

- Find the balance after the initial payment.
- Find the number of month units.
- Find the value of a monthly installment.
- If Kamal obtains a loan for the amount in (I) above from a bank at 12% annual rate of interest to pay it back within 24 months under reducing balance and buys this phone, calculate the advantage received.

02). Following is an incomplete table prepared to draw the function  $y = (x - a)(x - b)$

x	-1	0	1	2	3	4	5
y	8	3	0	.....	0	3	8

- Write the values  $a$  and  $b$  of  $y = (x - a)(x - b)$
- Find  $y$  when  $x = 2$
- Draw the graph by using a suitable scale.  
By using your graph,
- Describe the function when the value of  $x$  increases from  $-1$  to  $+1$ .
- Find the value of  $\sqrt{2}$  by using the graph received by moving the above graph 1 unit vertically downward.

03). It is equal to  $\frac{5}{6}$  when 7 is added to both numerator and denominator of a fraction whose numerator is x and denominator is y. When 7 is subtracted from numerator and 5 is subtracted from denominator it is equal to  $\frac{1}{2}$ . Find the initial fraction (8 marks)

If  $\frac{p}{q}$  is an equivalent fraction to the above fraction, write the fraction such that  $p > 30$  and  $q < 60$  (2 marks)

04). By unfolding a circular wire of radius  $\frac{35}{11}$  cm, a rectangular wire frame with maximum perimeter is prepared.

i) By taking the length of the above frame as x cm, write its breadth in terms of x. (2 marks)

ii). If the area covered by that frame is  $23\text{cm}^2$ , show that x satisfies  $x^2 - 10x + 23 = 0$  (3 marks)

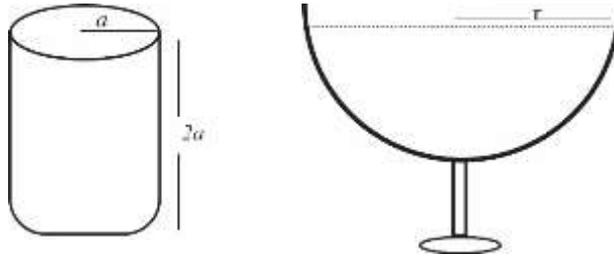
iii). Find the length and breadth of that wire by completing squares or other method. (Take  $\sqrt{2} = 1.4$ ) (5 marks)

05). Following information is revealed from a certain set of cricket players.

- 18 of them have participated 20 – 20 matches, all of them have participated one day matches but none of them have participated for test matches.
- Number of players who participated for one day matches is twice that of 20 – 20 matches.
- Number of players who participated only for test matches is 25% of the players who participated for one day matches..
- Number of players who participated only for one day matches is  $\frac{1}{2}$  of the total number of players who participated for one day matches and test matches.

The ratio between the participation in any of the above matches and participation in none of the above is 9 : 1. Represent the above information in a venn diagram and show that the number of players who participated for test matches do not exceed 45% of the total.

06). Water is filled to a cylindrical shaped glass with radius  $a$  and height  $2a$ . That amount of water is exactly enough to fill another hemispherical glass of radius  $a$ .



- i. Show that the volume of water in the cylindrical shaped glass is  $2\pi a^3$  ( 2 marks)
- ii. Develop a relationship between the volumes of glasses and show that  $a = \frac{r}{\sqrt[3]{3}}$  (3marks)
- ii. If  $r = 3.85\text{cm}$ , find the value of  $a$  to the nearest first decimal place by using the logarithmic tables ( 5 marks)

**Part B**

07). Aruni who is a dress maker decides to fix pebbles for a saree in a circular pattern such that the number of pebbles in a certain circle is twice that of its inner circle. She fixed 3 pebbles in the smallest circle and there are 10 circles in one design. She decides to make 2 such patterns for a saree.. If one pebble costs 50 cents, show that she has to spend more than Rs. 1500 for this work.

(10 marks)

- 08). i). Construct  $\hat{B}AC$  such that  $AB = 7\text{cm}$ ,  $\hat{B}AC = 120^\circ$  and  $AC=5\text{cm}$  ( 2 marks)
- ii). Construct the circle which goes through C and touches AB at A ( 4 marks)
- iii). Construct the other tangent from B to the circle and name the point of contact of that tangent as D. ( 1 mark)
- iv). Join CD and AD and decide the value of  $\hat{ADC}$  by giving reasons.( 3 marks)

09). S and T are the mid points of the sides PQ and PR of the triangle PQR. The straight lines QT and RS intersect at U. Produced PU intersects QR at V and the parallel line drawn through Q to SR at W. Show that  $PW = 4UV$ .( 10 marks)

10). The chord PQ of the circle with center O is produced to R. The points S and T are situated on the circle. Moreover,  $PX = XQ$  and  $OQ = OR$

i). What is the value of  $\widehat{OXQ}$  State the geometrical relationship you used.( 2 marks)

If  $\widehat{QOR} = x$ , state the values of the following angles by giving

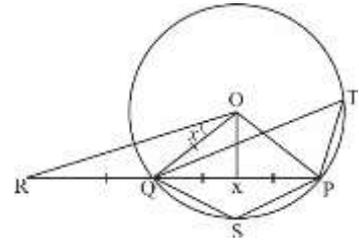
reasons.

ii).  $\widehat{OPX}$  (2 marks)

iii).  $\widehat{POQ}$  (2 marks)

iv).  $\widehat{QSP}$  (2 marks)

v).  $\widehat{PTQ}$  (2 marks)



11). (a). The bearing of P from T which is situated on a flat ground is  $070^\circ$  and the distance is 4km. S is situated from a bearing of  $090^\circ$  and 5km away from P.

(i). Draw a scale diagram and find the distance TS. (3 marks)

(b). R which is 12m away from the bottom of a building is seen from a window A which is on the same building with an angle of depression of  $60^\circ$ . Find the angle of depression of R when it is seen from a point B which is 6m vertically above A. (7 marks)

12). Following table gives the information about the number of vehicles passed during 10 minutes through a point in which the speed is measured in an Express way. 60 – 70 means more than 60 and less than or equal to 70.

Speed $\text{Kmh}^{-1}$	60 - 70	70 - 80	80 -90	90 - 100	100 - 110	110 - 120
No. of vehicles	1	6	12	19	20	2

i). What is the maximum speed of a vehicle in kilo meters per hour? ( 1 mark)

ii). Calculate the mean speed of a vehicle. ( 6 marks)

iii). A vehicle which goes 5 hours with that mean speed, stops for an hour and the return journey takes 6 hours. Find the average speed of that vehicle. (3 marks)