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Divisional Education Office – Rathnapura I

32 | E | I

11 ශ්‍රේණිය ප්‍රථම වාර පරීක්ෂණය - 2020 මාර්තු

First Term Test Grade 11 - March 2020

ගණිතය I
Mathematics I

පැය දෙකයි
Two hours

Index Number : ....

Certified Correct

....
Signature of Invigilator

Important :

- The question paper consist of 8 pages.
- Write your **Index Number** correctly in the appropriate places on **this page** and on **page three.**
- Answer **all** questions **on this question paper itself.**
- Use the space provided under each question for working and writing the answer.
- It is necessary to indicate the **relevant steps** and the **correct units** in answering the questions.

  Marks will be awarded as follows :

  In Part A

  2 marks for each question

  In Part B

  10 marks for each question
- Blank papers can be obtained for scratch

For Marking Examiner's Use Only

Part	Question Number	Marks
A	1 - 25	
B	1	
	2	
	3	
	4	
	5	
Total		

Examiner ....

Prepared by: R/Sivali Central College

Part A

Answer all the questions on this paper it self.

The area of a curved part of the right cylinder with radius r and height h is $2\pi rh$

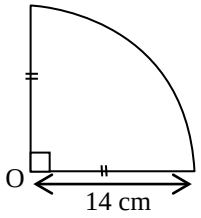
1. Underline the appropriate inequality to find the first approximation of $\sqrt{72}$.

   (i) $7 < \sqrt{72} < 8$ (ii) $8 < \sqrt{72} < 9$

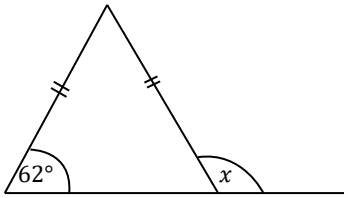
   (iii) $9 < \sqrt{72} < 8$ (ii) $8 < \sqrt{72} < 10$

2. Cost of a bicycle is Rs.50000. 12% of custom duty is added to this bicycle when importing. Find the custom duty that has to pay for this bicycle.

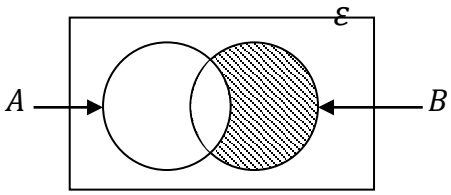
3. Find the perimeter of the sector with the center 'O'.



4. Find the value of x using the information given in the figure.



5. Write down the shaded region using the set notation.

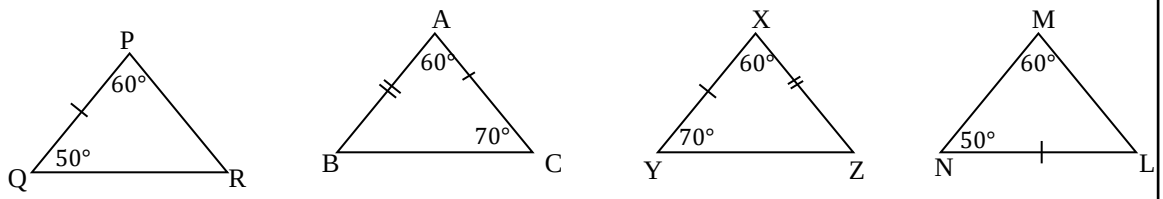


6. Simplify. $\frac{2}{x} + \frac{4}{3x}$

7. Consider the experiment of tossing the unbaised coin twice. Mark the sample space of this on a grid.

[See Page Three]

8. Name the triangles which are congruent and write down the relavant condition of congruency.

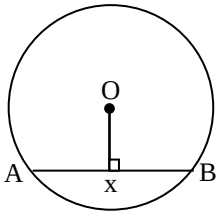


9. Write down the gradient and the intercept of the function $4x + 2y = 1$

10. Write down in the form of indices $log_4\ 64 = 3$

11. Find the L.C.M. of the algebraic expressions $x^2 - y^2$ and $x^2y - xy^2$

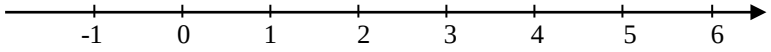
12. The center of the circle is 'O'. The length of the chord AB at a distance of 6cm from the center is 16cm. Find the radius of the circle.



13. Find the height of the cylinder which the radius is 7cm and surface area of the curved part is 880cm^2. (The surface area of the curved part of a cylinder with radius r and height h is $2\pi rh$)

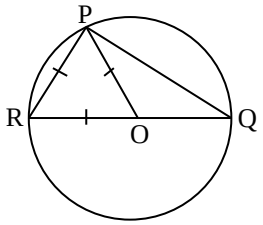
[See Page Four]

14. Represent the integral solution of the following inequality on the number line $2x + 3 \geq 7$



15. The average speed of flowing water of a pipe is $50 l min^{-1}$. The capacity of the tank is $1000 l$. Find the time needed to fill this tank completly.

16. The center of the circle is O and POR is an equilateral triangle. Find $Q\hat{P}O$.

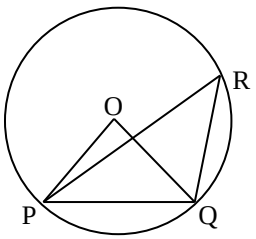


17. Simplify. $\frac{3x-1}{4} = 2$

18. Factorize $3x^2 + 4x + 1$

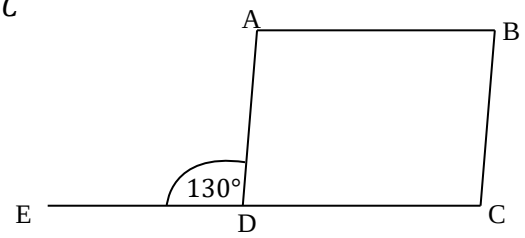
19. Eight machines can be harvested the half of the paddy field within 5 hours. How many hours are needed to complete the whole work using 10 machines.

20. Center of the circle is O. $P\hat{R}Q = 50°$ Find the value of $O\hat{P}Q + O\hat{Q}R$



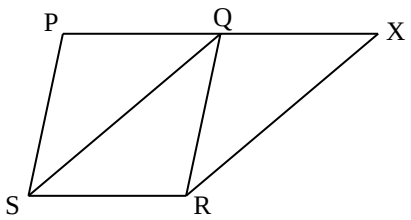
[See Page Five]

21. $ABCD$ is a parallelogram. Find the magnitude of $A\hat{B}C$



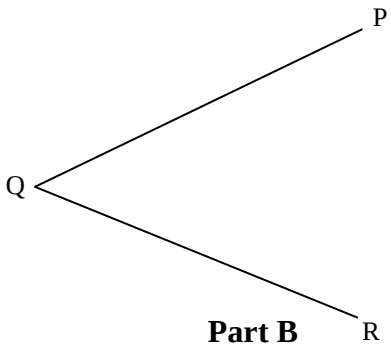
22. Which term is Zero in the geometric progression $32, 28, 24, \ldots\ldots, \ldots\ldots \ldots\ldots$

23. $PQRS$ and $QXRS$ are parallelograms. X is on the extended PQ. Area of the triangle PQS is $20cm^2$. Find the area of the quadrilateral $PXRS$.



24. The angle of depression of the point 'C' from the point B on the horizontal building is $50°$. Point C is 70m away from A on the vertical ground. Illustrate these data on the given diagram.

25. Following sketch diagram is drawn to find the point 'O'. Which is in equidistance from the straight lines PQ and QR and 5cm from the point P. Complete the diagram and mark the point 'O'.



Part B

[See Page Six]

Answer all the questions on this paper it self

(01). From a group of people who are scheduled to take an educational tour $\frac{2}{7}$ are boys of the Science section and $\frac{1}{2}$ are girls of the Science section. $\frac{2}{3}$ of the remaining people are the students of the Maths section. Then 5 people are remaining and they are teachers.

i. What fraction is the boys and girls of the Science section out of the total people.

ii. What fraction is the Maths students out of the total people.

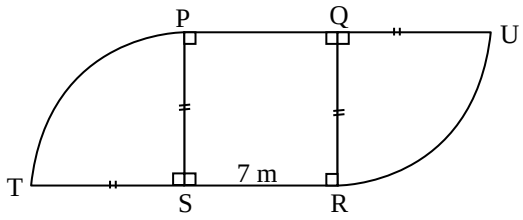
iii. If there are 76 seats on the bus that is ready for the trip, find out the number of seats remaining after all participants have been seated.

iv. Some another students of the Maths section are joined the educational trip again. They seated on the remaining seats. Then the total number of Maths students who joined the trip are 15. Show that only one seat is remaining.

(02) Following figure shows a flower bed of a certain garden,consisting two sectors and a square. The length of a side of square PQRS is 7m.

i. Find the radius of the sector.

ii. Find the perimeter of the flower bed.



iii. Find the area of the flower bed

iv. A teacher advised to reserve an isosceles triangular part inside the square shaped flower bed. One side of it is SR and the area is $14m^2$. Draw this on the figure with the measurements.

[See Page Seven]

(03)

(a) Amal rents his house for a year and takes Rs.15000 per month. He pays 8% of this as annual the assessment tax to the government.

i. Find the annual income he gets from renting the home.

ii. Find the amount he pays as assessment tax for a quarter.

iii. He deposited the amount after paying the tax on a bank for 2 years. The bank pays simple annual interest rate of 9%. Find the total amount he gets after two years.

(b) Tharindu bought a mobile phone for Rs.12000 from a certain company which takes a custom duty of 20%. Find the cost of the mobile phone after paying the custom duty.

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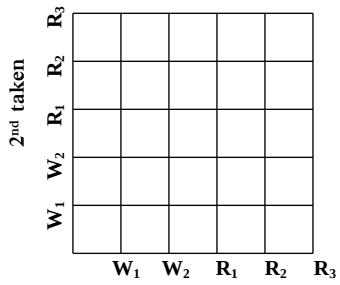
(04) There are 2 identical white coloured beads and 3 identical red coloured beads in a box. A boy took one at random, noted its colour, replaced it and took another and noted its colour.

i. Mark the sample space on the given grid.

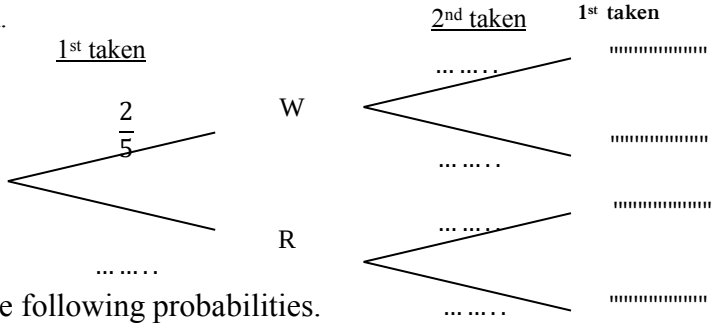
ii. Mark the event which obtain atleast one white coloured bead on the grid and find the probability.



iii. Complete the folowing tree diagram.

W – Taking a white bead

R – Taking a red bead



iv. Using the tree diagram find the following probabilities.

(a) The first bead is red and second bead is white.

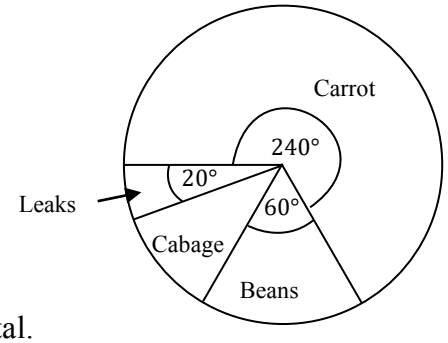
(b) Both beads are same in colour.

[See Page Eight]

(05) Following pie chart shows how a garden is reserved to grow vegetables.

i. Which vegetable is grown least.

ii. Find the ratio between Leaks and Beans cultivated in this garden.



iii. What fraction of carrot is grown in this land from the total.

iv. If the area of the portion which grows Cabage is $60m^2$. Find the area of the whole land.

v. Find the area of the land which grows Beans.

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Divisional Education Office – Rathnapura I

32 | E | II

11 ශ්‍රේණිය ප්‍රථම වාර පරීක්ෂණය - 2020 මාර්තු

First Term Test Grade 11 - March 2020

ගණිතය II
Mathematics II

පැය තුනයි
Three hours

Important :

- Answer **ten** questions selecting **five** questions from **Part A** and **five** questions from **Part B.**
- Write the **relevant steps** and the **correct units** in answering the questions.
- Each question carried **10 marks.**
- The volume of a cylinder of radius r and height h is $\pi r^2 h$
- The volume of a sphere with radius r is $\frac{3}{4}\pi r^3$
- The Surface area of a curved part of a cylinder with radius 'r' and highest 'h' is $2\pi rh$
- Area of a circle with radius r is πr^2

Part A
Answer 5 questions only

(01) a) Wajira bought a land, and started a car sale. The annual assessed value of the land is Rs.3,000,000. The municipal council charges 30% of annual assessment tax. He imported a motor vehicle to his car sale by paying Rs.1,445,000. The import duty of 70% is charged for this.

i. Find the total amount he pays as annual assessment tax.

ii. Find the quarterly payment of assessment tax.

iii. Find the cost of the vehicle before paying the tax.

iv. Wajira needs to obtain 20% of profit from the imported vehicle. So, find the selling price of the motor vehicle.

b) The total amount paid for a loan which is taken at 10% of annual simple interest rate after 5 years is Rs.45,000. Find the amount of the loan.

[See Page Two]

(02) An incomplete table prepared to draw the graph of the function $y = 4 - 2x^2$ is given below.

x	-3	-2	-1	0	1	2	3
y	-14	-4	.....	4	2	-4	-14

i. Find the value of y when x = -1

ii. By taking 10 small divisions of the graph paper to represent one unit along the x axis and 10 small divisions to represent two units along the y axis as the scale, draw the graph of the function.

Using the graph;

iii. Write the co-ordinates of the turning point.

iv. Write down the range of values of x where the function is negatively decreasing.

v. Find the value of $\sqrt{2}$

(03) Price of 3 oranges and 2 apples is Rs.205. The cost of 3 apples is Rs.80 more than the cost of 2 oranges.

i. By taking the price of an orange as x and the price of an apple is y, build up two simultaneous equation using the terms of x and y.

ii. Solve them and find the price of an apple and an orange separately.

iii. Find the maximum number of apples and oranges can be bought for Rs.500 without remaining.

(04) The following table summarize the marks obtained from 40 persons who sat a written test, which is conducted to gauge the language proficiency of government employees. (the class interval 0-10 means $0 \leq x < 10$)

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of employees	4	4	8	12	7	3

i. What is the modal class of this distribution?

ii. What is the highest mark of an employee?

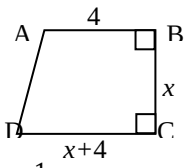
iii. Taking the mid-value of the modal class as the assumed mean, find the mean mark of an employee.

iv. 75% of the employees of this was passed the examination. Find the minimum mark obtained by a passed employee.

[See Page Three]

(05) a) Find the value of x. $\frac{9}{2x-6} - \frac{2}{x-3} = \frac{5}{8}$

b)



i). Build an equation to find the area of the given trapezium in terms of x. Area of the trapezium is 20cm^2

ii). Solve it and find the length of the side DC

c). If $x - \frac{1}{x} = 3$ find the value of $x^2 + \frac{1}{x^2}$

(06) a) The window "B" is 10m above from the foot of the building "A". The angle of depression of observing the foot of another building C from B is 40^0. The angle of elevation of the top of the same building (D) is 30^0.

Use a suitable scale and draw a scale diagram.

Using the drawn diagram find the actual distance of AC and CD.

b) Rs. 543 is enough to buy 2 pineapples and 3 water melons. If the price of a pineapple is Rs.75 and the price of the water melon is Rs. *x* build an inequality for these information. Solve it and find the maximum amount of the water melon.

[See Page Four]

Part B
Answer 5 questions only

(07) The design was made by fitting the bulbs in circular shaped rings. The bulbs are fixed as an arithmetic progression such as six bulbs in the inner circle and 10 in the outer circle and show on.

i. Find the common difference of this arithmetic progression.

ii. How many bulbs are there in the 8th circle?

iii. Which is the smallest ring that can be made using more than 89 bulbs.

iv. It is going to made such 25 rings. Is that 1340 bulbs sufficient for this purpose? Give the reasons.

(08) Using a straight edge, a pair of compasses and a cm/mm scale only and showing all construction lines clearly.

i. Construct the triangle ABC in which $AB = 7\ cm, B\hat{A}C = 60^\circ$ and $AC = 5.5\ cm$

ii. Construct a rectangle in the side of 'C' as its area is equal with the twice of the area of the triangle ABC. Name it as $ABDE$.

iii. Name the mid-point of AD as O .

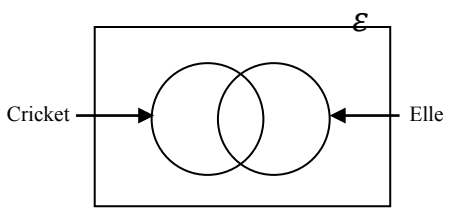
iv. Construct the circle by taking the radius as OA and center is O. Measure the radius.

(09) A hemispherical portion with diameter $2x$ is removed from a cylindrical wooden block with diameter $3x$ and night $4x$ and made a motor.

Show that the volume of this motor is $\frac{25x^3\pi}{3}$ If $\pi = 3.14$, $x = 8.5\ cm$ find the volume the motor to the nearest first decimal place using the log tables.

(10) a) The information about the students who like for Cricket and Elle from 44 students are given below.

- ✳ 25 like Cricket
- ✳ 23 like Elle
- ✳ 5 do not like both sports.



i. Copy the Venn diagram to your answer script and enter the above given information in it.

ii. Find the number of students who like both sports.

iii. Shade the region of the students who do not like Elle.

iv. Find the probability of a randomly selected student to be a student who do only one sport.

[See Page Five]

(11) The mid-point of PR of the triangle PQR is 'S'. The line drawn through the point P as parallel to RQ meets extended QS at T

i. Mark the above information on a diagram.

ii. Show that $\Delta PST \equiv \Delta QSR$

iii. Show that $PQRT$ is a parallelogram.

iv. Write down the relationship between the areas of the ΔPQR and parallelogram $PQRT$. Write down the theorems you used for this.

(12) PQ is the diameter of the circle with radius 'O'. The mid point of RQ is X.

Prove that $S\hat{P}O = S\hat{Q}X$.