B/ Vishaka Balika M.M.V - Bandarawela

Second Term Test - 2024

English Medium

ගණිතය I Mathematics I	11 ශ්‍රේණිය Grade 11	කාලය : පැය 02 Time : 02 hours

Name/Index number : .....

Certified Correct

.....

Signature of Invigilator

Important :

* This question paper consists 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.
* Indicate the **relevant steps** and the **correct units** when answering the questions.
* Marks are 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 work.

For Marking Examiners' Use Only		
Part	**Question Numbers**	**Marks**
A	1 - 25	
B	1	
	2	
	3	
	4	
	5	
Total		

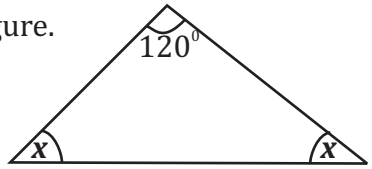
Part A

answer all the questions

01. Custom duty of 12% is charged for a certain item that is imported. If the value of this item is Rs. 5000, find the amount that has to be paid as Customs duty.

02. Find the factors : $x^2 + 5x - 24$

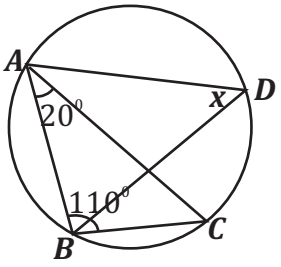
03. Find the value of x according to the information given in the figure.



04. It is given that $\log_3 x = 4$, find the value x.

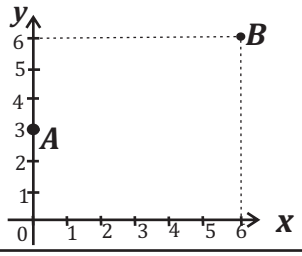
05. Find the time it takes to fill a tank of capacity $120cm^3$ using a pipe through which water flows at a rate of the 60 *litres* per minute.

06. The points A, B, C and D lie on the circle shown in the figure.
Find the value of x.



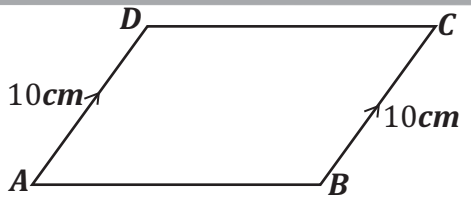
07. The area of the curved surface of a right circular cylinder is $88cm^2$. It's base radius is $7cm$. Find it's height.

08. Find the gradient of the straight line represented by AB in the figure.



09. Simplify : $\frac{5x^2}{7y^3} \div \frac{15x^3}{14y^2}$

10. By using following quadrilateral



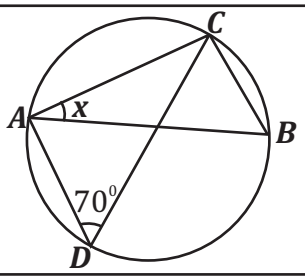
(i) Name an angle which is equal to $A\hat{B}C$

(ii) Find the value of $A\hat{B}C + B\hat{C}D$

11. Solve : $3x^2 - 12 = 0$

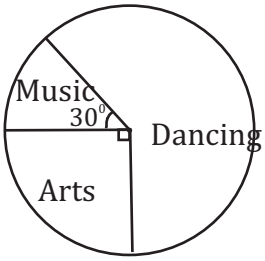
12. 6 men take 4 days to dig a drain. 2 men worked for 2 days. Find the remaining work in man days.

13. ***AB*** is the diameter of the circle shown in the figure.
Find the value of ***x*** according to the given information.



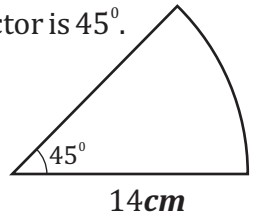
14. A bag contains 10 to 20 red and different colour identical balls. The probability of a ball drawn at random from the bag being red is $\frac{3}{7}$. How many balls in total are there in the bag ?

15. The students in a certain school who study the subjects Arts, Dancing and Music are represented by the Pie Chart. If the number of students who study art is 45, How many students study Dancing.



16. Find the **L.C.M.** of the following 3 algebraic terms $3x^2$, $6xy$ and $2y$

17. Find the perimeter of the sector when it's radius is 14***cm*** and angle of sector is 45^0.

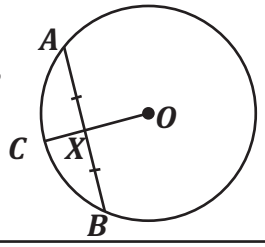


18. If A and B are 2 sets such that n(ε)=16, n(B)=8, n($A \cup B$)=10, n($A \cap B$)=3,

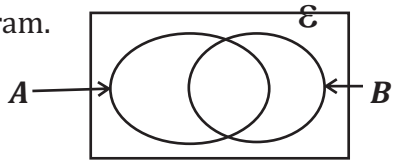
(i) Find the value of n (A).

(ii) Find the value of P (A).

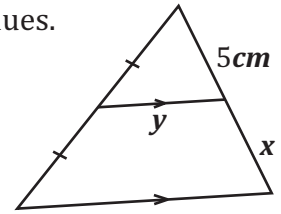
19. The centre of the given circle is O. and its radius is 10cm.
X is the mid point of the chord AB. If the length of the chord AB is 16cm, then find the length of CX.



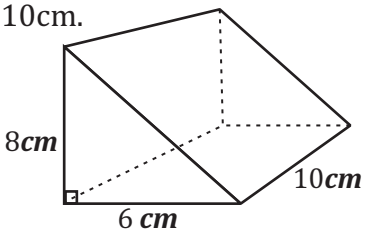
20. Shade the region that represents $A' \cap B$ in the given Venn diagram.



21. According to the information given in the figure, find the x and y values.



22. The length of a right prism with a right triangular cross section is 10cm.
Find its volume.



23 For the statements given below mark a "✓" in front of each of the correct statement and a "✗" in front of each of the incorrect statement.

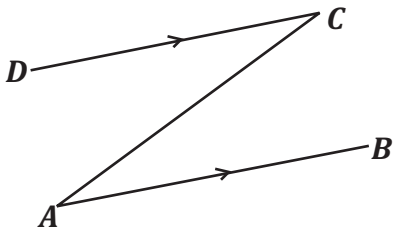
i. All the circles are congruent

ii Shapes and size are equal in congruent polygons

iii Right angled triangle is only congruent in case R. H. S.

24. Solve : $\frac{1}{x} + \frac{1}{2x} = \frac{1}{6}$

25. In the figure given below CD is a locus of points which are at a constant distance from a straight line AB. The location of a point which is on the straight line CD and equidistant from the points A and B. Complete the figure using the knowledge on loci and mark the point.



Part B

answer all the questions

01. In a certain road first part is made with bitumen. It is $\frac{2}{7}$ of the whole road while $\frac{3}{4}$ of the remaining part of the road is made by concrete and the remaining part made with gravel.

(i) What fraction of the whole road is made without bitumen.

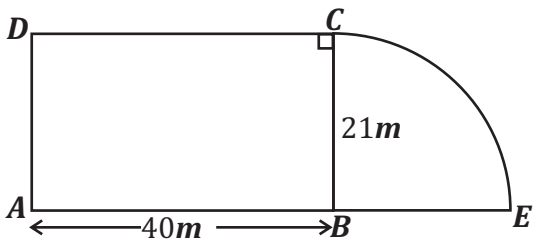
(ii) What fraction off the whole road is made with concrete.

(iii) Show that the part of the road that made with concrete is 3 time the part of the road which made with gravel.

(iv) If the length of the part of the road which made with concrete is 225***m***, then find the length of whole road.

02. Given below is a plan of a land consisting with a rectangular plot ***ABCD*** and a sector ***BEC*** part..

(i) Find the area of the rectangular plot ***ABCD***.



(ii) Find the area of the sector of ***BEC***.

(iii) It costs Rs. 840 for 1 m^2 of cement to cover the ***BCE*** part. Find the cost of covering the cement in this floor.

(iv) It is planning to make a gate with 8***m*** long along the middle of ***CD*** side and also it is required to add a right angled triangular plot which is plant banana of $\frac{1}{4}$ area is equals to the area of the ***ABCD*** rectangular plot with ***AD*** as a side, and without disturbing the gate, Draw a sketch of this triangle with its measurement in the above figure.

03. (a) The annual assessed value of a house is 40 000 rupees.

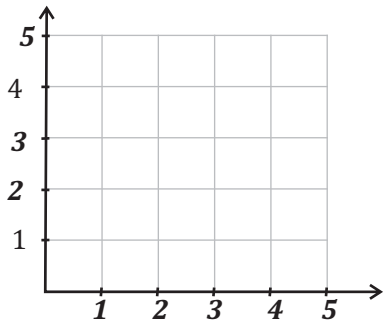
(i) If the Urban Council charges annual rate of 8% on this property, Find how mcuh has to be paid as rates for a quarter.

(ii) After several years the assessed value of the house changed. The annual rate percentage that the Urban Council chargers also increased to 10%. If the amount to be paid as rates for a quarter increased by *Rs*. 80 as a result, Find the new annual assessed value of the house.

(b) If a person takes a loan of *Rs.* 12 000 at a compound interest rate of 8% per year, calculate the interest for the 2nd year.

04. (a) There are 5 identical balls numbered from 1 to 5 in a box. A ball is taken from the box randomly and the number is recorded. Then the ball is put back in the box. (with replacement) and again a ball is randomly taken for a 2nd time and this number also recorded.

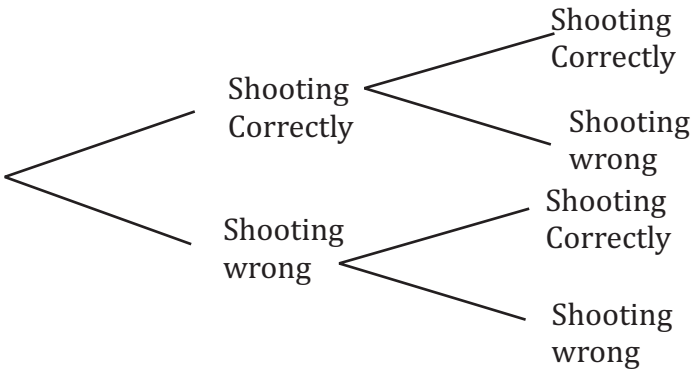
(i) Show the relevant Sample Space on the given grid.



(ii) Mark the event of being the same ball is taken on both occasions and find its probability.

(b) The probability that the shooter is a certain game shoots the ball correctly is $\frac{3}{5}$. one shooter can shoots 2 times.

(i) Complete the tree diagram by indicating the relevant probabilities.



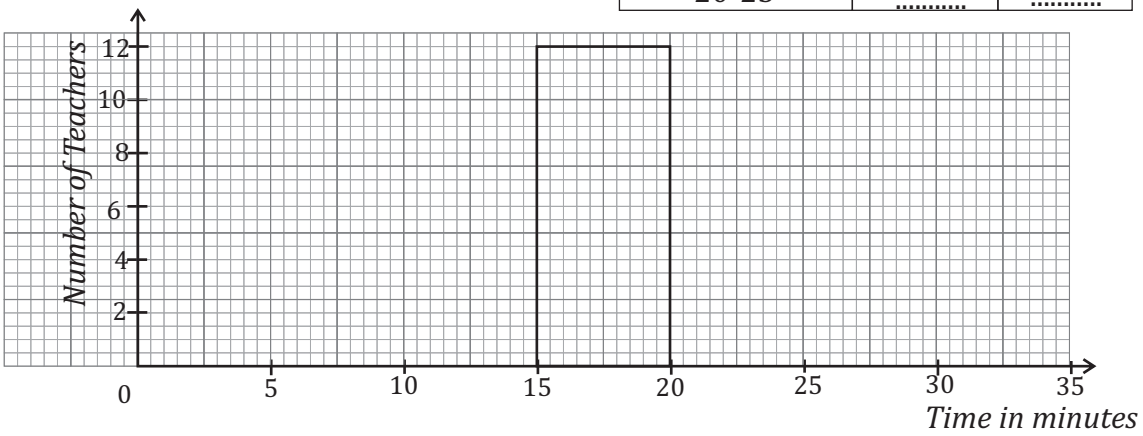
(ii) Find the probability of shooting correctly at least once.

05. An incomplete frequency distribution and an incomplete histogram showing information on the daily attendance of the teachers of a certain day in a school. (The Interval 0-5 represent the marks greater than to 0 and less than or equal to 5)

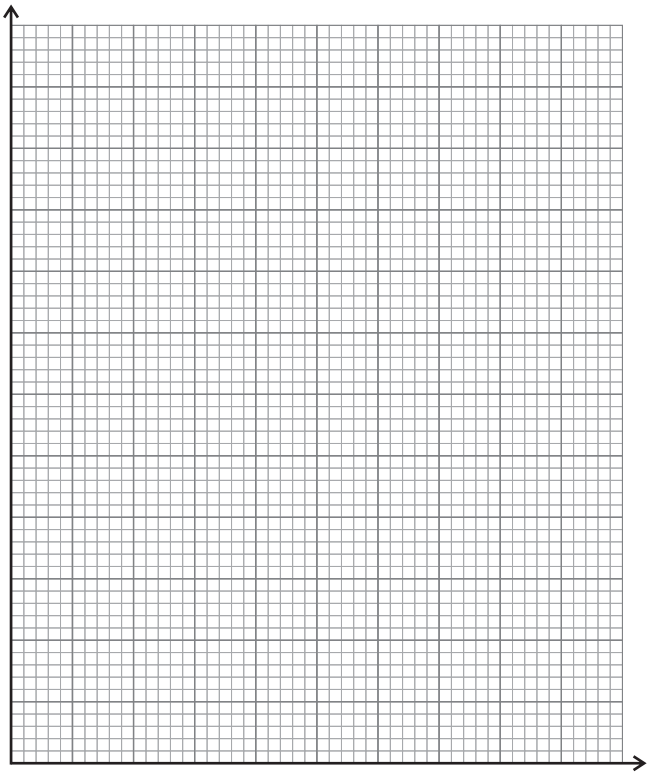
(i) If 32 teachers came before starting the school on that day . By using the data in the histogram fill in the blanks in the given table.

Class interval of Time	Number of Teachers	Cumulative Frequency
0-5	3	.....
5-10	5	.....
10-15	7	.....
15-20	.....	.....
20-25	.....	.....

(ii) Complete the histogram using the above information.



(iii) Complete the cumulative frequency column in above table and draw the cumulative frequency curve on the given coordinate plane.



(iv) Using this curve, find the median number of teachers who came before starting the school.

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දෙවන වාර පරීක්ෂණය - 2024 English Medium

ගණිතය II
Mathematics II

Grade 11
11 ශ්‍රේණිය

කාලය : පැය 03
Time : 03 hours

* *Answer* ***ten*** *questions selecting* ***five*** *questions from part* ***A*** *and* ***five*** *questions from part* ***B.***
* *Each question carries 10 marks.*
* *The volume of a cone base radius* r *and height* h *is* $\frac{1}{3}\pi r^2 h$ *volume of a cylinder radius* r *is* $\frac{1}{3}\pi r^2 h$

Part A

01. The following notice have been issued regarding the interest paid by Bank ***A*** and Company ***B*** for deposits.

Bank A
An annual simple interest of 12 % for your fixed deposit

Company B
An annual dividends of Rs. 2 per share, at the market price of Rs. 25 per your share.

Amasha had 100 000 rupees. She deposited exactly half of it in the bank A and the remaining half spend to buy shares in company B. After receiving dividends for a year, she sold all her shares when the market price per share was Rs. 27.

(i) From which investment will she receive a greater income at the end of the year.
(ii) Express her capital gain as a percentage of the amount invested.

02. A complete table showing the y values corresponding to several x values of the quadratic function $y = b - (x - a)^2$ is given below.

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

(i) Using the standard system of axes and a suitable scale, draw the graph of the given quadratic function on a graph paper according to the above table of values.

(ii) Using the graph that you drew, draw and name the equation of its axis of symmetry.
(iii) Using the graph that you drew, find the values of a and b.
(iv) Write the interval of values of x on which the quadratic function is positive.
(v) Find the value of $\sqrt{3}$ to the first decimal place.

03. (a) It cost *Rs*. 500 to buy 3 oranges and 5 mandarins. The cost of 5 mandarins can be bought for the cost of 2 oranges.

(i) Taking the price of an Orange as x rupees and the price of a mandarin as y rupees, construct a pair of simultaneous equations that represent the above information.

(ii) By solving these equations, find separately the price of an Orange and the price of a Mandarin.

(b) Simplify : $\frac{5}{a-2}+\frac{1}{a^2-4}$

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04. Sudheera is involved in a small industry which produces concrete bricks. He deployed an employee to make bricks. Information regarding the number of bricks he produced each day is shown in the following frequency distribution.

Number of bricks	40-50	50-60	60-70	70-80	80-90	90-100
Number of days	1	3	7	10	5	4

(i) Find the modal class of this distribution.

(ii) Find the mean number of bricks, taking the mid value of the modal class as the Assumed Mean.

(iii) Sudheera accepts an order to return 2500 bricks within 2 weeks. But he had 428 in hands. Find the minimum number of employees Sudheera has to deploye for this task.

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05. The diagonals of a Rhombus is bisects perpendicularly. The area of a Rhombus is $14cm^2$, When the length difference of the diagonals are 4 cm. By taking the length of the shortest diagonal as $2x$, Show that x satisfies the quadratic equation $x^2+2x-7=0$.

By Solving the quadratic equation show that only one value can be taken for the x with reasons.

By taking the value of $\sqrt{2}=1.41$, find the length of the shortest diagonal.

---

06. A man standing at a point ***A*** of the level ground observes the top of the vertical tower with an angle of elevation of 15^0. He reached point ***B*** by walking *50m* towards from the point ***A***. He also observes the top of the tower at point ***B*** with an angle of elevation of 30^0. (tower, point ***A*** and point ***B*** located on same level of ground)

(i) Sketch a diagram to depict the given information.

(ii) By selecting suitable scale draw the scale diagram.

(iii) Using the diagram,

(a) Find the height of the tower.

(b) Find the distance between the foot of the tower to point ***B***, to the nearest whole number.

(iv) The point ***C*** is located 25 *m* away from the foot of the tower and observes the top of the tower at point ***C***. Measure the angle of elevation using protractor.

Part B

07. (a) A decoration consists of several circles containing small bulbs. There are 5 bulbs in the first circle. 9 bulbs in the second circle, 13 bulbs in the 3rd circle and so on. Starting from the first circle when the number of bulbs in each of the circles is considered in order, they are in an Arithmetic progression.

(i) How many bulbs are there in the 10th circle ?

(ii) If the total number of bulbs in the first n-number of circles is S_n, show that $S_n = n(2n+3)$.

(iii) If the decoration consists of 40 circles, find the total number of bulbs in the decoration.

(b) Find the seventh term of a a geometric progression with common ratio(-2) and the first term is 3.

08. Using only a straight edge with a ***cm/mm*** scale and a pair of compass for the following construction show the construction lines clearly.

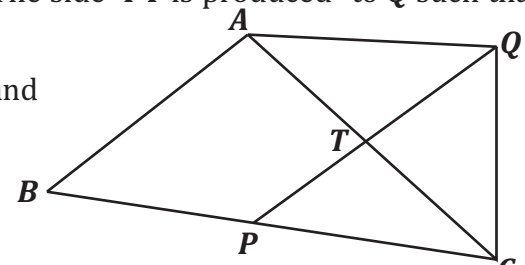
(i) Construct the triangle ABC such that $AB = 8.5cm$, $A\hat{B}C = 90^0$, $BC = 8.5cm$

(ii) Construct the bisector of the $A\hat{B}C$. Name the pint at which it meets AC as D.

(iii) Find the centre of the circle that has BD as a diameter and construct this circle.

(iv) Measure the radius of the circle.)

09. In the triangle ABC shown in the figure, P is the midpoint of the side BC. The straight line drawn through P parallel to BA meets AC at T. The side PT is produced to Q such that $PT = TQ$



(i) Copy the given figure into you answer script and include the above data in it.

(ii) Give reasons to be $AT = TC$

(iii) Show that $PTC\,\Delta \equiv ATQ\,\Delta$

(iv) If 'the area of the triangle AQT= the area of the triangle CQT' Then prove that, area of the quadrilateral $ABCQ$ is 6 times the area of the triangle CTQ

10. In a certain day 100 customers came to a resturent , 70 had rice and curry, 55 had tea and 24 did not have rice and curry. But they had tea.

(i) Represent this information in a Venn diagram.

(ii) How many of the customers do not had their tea ?

(iii) How many of the customers do not had either of these ?

(iv) If the customers who had rice and curry did not have their tea, then represent this in a new Venn diagram.

11. The height of a right circular solid cone is 3 times its base radius. By melting this cone without any wastage it can make 9 similar solid spheres of radius ***a*** *cm*. Show that the base radius of the cone is $\sqrt{1.5}\,\boldsymbol{a}$ and by using 2.58 for value of a, Find the base radius of the cone to the nearest cm using the logarithm table. .

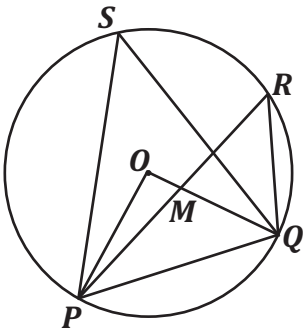
12. The centre of the circle in the figure is ***O***. Points ***P, Q, R*** and ***S*** are on the circle.
$\boldsymbol{P\hat{O}Q} = 60^0$.

(i) Find the magnitude of $\boldsymbol{P\hat{S}Q}$.

(ii) Write down the theorem that use to find the value of above angle.

(iii) Write down the relationship between $\boldsymbol{P\hat{S}Q}$ and $\boldsymbol{P\hat{R}Q}$ with reasons.

(iv) Show that $\boldsymbol{P\hat{R}Q} = \boldsymbol{M\hat{Q}R} - \boldsymbol{O\hat{P}M}$.



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