Royal College - Colombo 07 32 E I ろうざあい විදාහාලය - කොළඹ 07 32 E I Grade 11- Third Term Test - 2023 (February 2024) 32 E I						
Mathematics - ගණිතය - I	කෙවත වාර පරකෂණය – 2023 (2024 පෙබරවාර) - 11 ලේ සංය Mathematics - I ගණිතය - I					
Name / Index No: Certified Corre Signature of Invigi	ct lator					
Important:	For M	• Marking Examiner's use only				
 This paper consists of 8 pages. Write your Index Number correctly in the appropriate places on this page and on page 	Part	Question Number	Marks			
three.	Α	1 - 25				
 Answer all questions on this paper itself. Les the space provided under each question 		1				
for working and writing the answer.		2				
It is necessary to indicate the relevant steps and the correct units in answering the		3				
 questions. Marks will be awarded as follows. Two morks each for questions 1, 25 in part 4. 	B	4				
Two marks each for questions 1 - 25 in part A . Ten marks each for questions in part B .		5				
A blank paper can be obtained for rough work from the supervisor on your request.	Total					
		Signature of Invigilator				

	Part - A Answer all questions on this paper itself
1)	Find the total distance of the journey if a distance of 7 km was left after completing $\frac{3}{4}$ of the journey.
2)	Simplify:2 – 0.2 × 0.3
3)	In the given figure, AB and CO are two straight lines. If $B\hat{O}C=3A\hat{O}C$, find the magnitude of $A\hat{O}C$.
4)	The volume of a sphere of radius r is 27 cm^3 . Find the volume of a sphere of base radius $2r$.
5)	Make <i>m</i> the subject of the formula: $y = mx + c$.
6)	Find the value of x based on the information given in the figure. 110° x 130°
7)	Simplify: $\frac{\sqrt{12}}{3\sqrt{2}}$
8)	If the area of the base of a right circular cone is $154 cm^2$, find the radius of the cone.

9) Find the interquartile range of the following sample of data. 3, 8, 2, 4, 6, 10, 15, 12, 18, 30, 25

10) In the triangle *ABC*, *DE* is drawn parallel to *BC*. If $AD = 4 \ cm$, $BD = 2 \ cm$ and $CE = 3 \ cm$, find the length of *AE*.

11) A cylindrical vessel of radius 14 *cm* is filled with water up to a height of 9 *cm*. Find the volume of water in the vessel.

12) Find the L.C.M. of $x(x^2 - x)$ and (1 - x)

13) In the figure, $PQ = 8 \ cm$, midpoint of PQ is S and midpoint of PR is T, PQ//TU, find the length of TU.



B

14) If $\begin{pmatrix} -4 & 2 \\ 3 & 1 \end{pmatrix} \begin{pmatrix} 2 & -1 \\ 0 & x \end{pmatrix} = \begin{pmatrix} y & 10 \\ 6 & 0 \end{pmatrix}$, find the value of x and y.

15) When a certain amount of money was divided between A and B in the ratio of 5: 3, B received *Rs*. 165. Find the total amount divided.

16) In the given regular polygon, find the value of x.

17) If (a - b) = 2 and (a + b) = 3, find the value of $a^2 - b^2$

18) A and B are two independent events. If $P(A) = \frac{1}{3}$, $P(B) = \frac{3}{4}$, find $P(A \cap B)$.

19) *ABCD* is a parallelogram. The bisectors of $B\hat{A}D$ and $A\hat{D}C$ meet at E. Find the magnitude of $A\hat{E}D$.

20) If P(3,2) and Q(0,-1), find the gradient and the intercept of the straight line PQ.

21) According to the given information, find the value of h.



Л

С



Part - B Answer all questions on this paper itself					
 Kamal who cultivates green gram, sold ¹/₃ of his harvest to cover the cost of cultivation and ³/₄ of the remaining harvest was stored for consumption. i. What fraction of the total harvest was remained after selling? 					
ii. What fraction of the total harvest was used for consumption?					
iii. What fraction of the total amount of green gram harvest remaining after selling and allocating for consumption?					
iv. After selling and allocating for consumption of green gram, the remaining portion was divided equally among his three sisters. If the quantity of green grams received by one sister is $3 kg$, what is the amount of green beans allocated for consumption?					
2) The shaded portion in the figure shows a design made to decorate a D					
cushions cover. Here two sectors of radius 10.5 <i>cm</i> and a circle of radius 3.5 <i>cm</i> have been cut out from a piece of cloths in the shape of a rhombus of length 30 <i>cm</i> . The perpendicular distance between parallel lines of the rhombus is 24 <i>cm</i> . i. Find arc length of <i>EF</i> .					
ii. It is required to attach a ribbon around the shaded portion. Find the length of the ribbon needed. F					
iii. Find the area of the shaded portion.					
iv. Find the number of beads required to attach beads with a gap of 2 <i>cm</i> alone the edge of the circular portion at the centre of the design.					

- 3) Mr. Saman invested *Rs*. 72 000 and bought shares in a certain media company when the market price of a share was *Rs*. 12. The company pays annual dividends of *Rs*. 3.50 per share for the investors i. Find the number of shares Mr. Saman bought.
 - ii. Mr. Saman sold all his shares on an occasion when the market price of a share was *Rs*. 15. On the next day, after he has sold all the shares, company had announced that it will pay dividends.
 - a. Find the capital gain earned by Mr. Saman
 - b. Express his capital gain as a percentage of the amount invested.
 - c. If he didn't sell the shares, find his dividend income.
- 4) The figure shows a pie chart indicating how the monthly income of a certain person was spent in a month. The amount spent on food is twice the amount allocated for other expenses.
 - i. Find the magnitude of the angle of the sector representing the other expenses.



- ii. If the amount deposited in the bank is *Rs*.8000, find the amount spent on clothes.
- iii. According to the pie chart given, find his monthly income.
- iv. Considering that he would get the same salary in the next month also, he deposited *Rs*. 4 000 that is to be spent on clothes, in the bank. According to this, find the magnitude of the angle at the centre of the sector which represents the amount deposited in the bank in a new pie chart.

- 5) In a bag, there are six identical cards numbered from 1 to 6. One card drawn out at random and the number is noted. Without replacing the first card, a second card is randomly drawn out and recorded the number.
 - i. Mark the sample space of the above random experiment on the grid.



- ii. In the grid, encircle the event that the sum of two numbers being greater than seven and find its probability.
- iii. An incomplete tree diagram relevant to above random experiment is given in the below figure, where A denotes the event of drawing a card numbered greater than 4 and B denotes the event of drawing a card numbered 4 or less than 4. Complete the tree diagram by indicating the corresponding probabilities



iv. Using the tree diagram, find the probability of drawing a card numbered greater than four at least once.

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	Grade 11 – Third Term Test – 2023 (February 2024) තොවන වාර පරීක්ෂණය – 2023 (පෙබරවාරි 2024) - 11 ශෝණිය							
	Mathematics - II ගණිතය - II	Time : 3 hours කාලය : පැය 3						
 Instructions: Answer 10 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 carries 10 marks. The volume of a cone of base radius r is 1/3πr²h The volume of a sphere of base radius r is 4/3πr³ 								
	Part - A Answer five questions only.							
 An incomposite several give several give a) i. Find the ii. Using of the b) Using the 	plete table consisting of y values of the function $y = -x^2 + 4x + 1$ of y values of x is given below. $ \frac{x -1 0 1 2 3 4 5}{y -4 1 4 \dots 4 1 -4} $ The value of y when $x = 2$. the scale of 10 small divisions as one unit along both x - axis and y - above function on a graph paper. graph.	corresponding to the axis, draw the graph						
i. Write ii. Expres iii. Write to the iv. Find th approxi	down the range of value of x for which $y \le 1$. so the given function in the form $y = -(x - a)^2 + b$. Here a and b are down the equation of the graph which is obtained when the above grap left along the x- axis and two units downwards along the y- axis. e roots of the equation $1 + 4x - x^2 = 0$ to the first decimal place imate value for $\sqrt{5}$.	two numbers. oh is moved one unit and hence obtain an						
2) A plot of a discour payment interest o	a land of 10 perches is priced at Rs.450 000 per perch. When outright at of 15%. If a person going for an installment plan, can purchase it of 10% and paying the rest in 5 years in equal monthly instalments on the loan was calculated on the reducing loan balance, calculate the ar	purchasing, it offers t by making a down of Rs. 83 970. If the nnual rate of interest.						

G11/2023(2024)/III/32/E-II

Methma runs a footwear manufacturing company. The following frequency distribution shows the information about the number of pairs of shoes that the company produced and released to the market within 30 days.

Number of pairs shoes	71-75	76-80	81-85	86-90	91-95	96-100
Number of days	01	06	08	10	03	02

- i. What is the modal class of the above frequency distribution?
- ii. Taking the mid-value of the model class as assumed mean, find the mean number of pairs of shoes produced in a day.
- iii. Methma's company received an order to supply 6 630 pairs of shoes for the upcoming festive season. Methma says that this order can be completed in three months by working 25 days per month. Show that Methma's statement is wrong.
- iv. At least how many extra days per month must be worked to complete this order in three months?
- 4) **AB** is a straight road passing through two military bases **A** and **B**. The camp B is located at a distance of 12 km from the camp A on a bearing of 101^{0} . A terrorist camp **C** is located at a distance of 10 km on a bearing of 137^{0} from the camp **A**.
 - i. Represent above information on a sketch.
 - ii. Intelligence has been received that the terrorists in the camp **C** are planning to attack an army truck traveling on the road AB by taking the shortest route to reach road AB. Using the trigonometric tables, find the distance from the camp **A** to the expected place of attack to the nearest kilometers.
 - iii. Accordingly, it was decided to launch a series of multi-barrel time gun attacks from the camp **B** to the terrorist camp and destroy it completely. Find the bearing of the terrorist camp **C** from the camp **B**.
- 5) (a) The prices of the entrance tickets to visit the lotus tower are given below.

• For a local adult - Rs 500 • For a local

• For a local child – Rs. 350

A group consisting of adults and children have decided to visit the lotus tower. The number of adults in this group is three less than twice that of children. The total cost of the entrance tickets for this group is Rs. 7 950.

- i. Take the number of children in this group as x and the number of adults as y and construct a pair of simultaneous equations that represents the above information.
- ii. By solving these equations, find separately the number of children and the number of adults in this group.
- (b) Solve the inequality $6(x-3) 1 \le 10x 3 < 9x$ and represent the solution on a number line.
- 6) In the given figure, a rectangular metal plate ABCD of length (x+2) cm and breadth 4 cm and a triangular metal plate of PQ = (x+3) cm and RS = (x-1) cm are shown. If the areas of two plane figures are equal, show that x is satisfies the quadratic equation $x^2 6x 19 = 0$, Solve the equation and find the value of x to the nearest first decimal place.

Hence find the area of one metal sheet. (Take $\sqrt{7} = 2.64$) A B



Part - B Answer **five** questions only

7)

- a) In a town hall has 15 rows of seats such as 15 seats in the first row, 21 seats in the second row, 27 seats in the third row and so on.
 - i. Find the number of seats in the 15th row?
 - ii. Which row has 81 seats?
 - iii. Find the total number of seats in the first 15 rows.
 - Nimal says that "485 more seats are required to arrange 20 rows of seats in this hall as above. Show that this statement is incorrect.

b) Find the 8th term of the geometric progression $1, -\frac{1}{3}, \frac{1}{9}, -\frac{1}{27}, \dots$ (Give your answer in index form)

- 8) Use only a straight edge with *cm/mm* scale and a pair of compasses for the following constructions.Show the construction lines clearly.
 - i. Construct the triangle ABC such that AB = 8 cm, $B\hat{A}C = 60^{\circ}$ and AC = 6.5 cm.
 - ii. Construct the perpendicular bisector of AB and name intersection point of AB and perpendicular bisector as X.
 - iii. Construct a circle which touches *AB* at *X* and *BC* at *Y*, mark the center of the circle as *O*.
 - iv. Construct another tangent to the circle from the point A and mark the tangential point as Z.
 - v. Show that *AXOZ* is a cyclic quadrilateral.
- 9) (a) Explain the theorem that "the angle which a tangent to a circle makes with a chord drawn from the point of contact are respectively equal to the angle in the alternate segment of the circle" using a diagram.
 - (b) According to the data given in the figure, O is the centre of the circle. PQRS is a cyclic quadrilateral. The line ASB is the tangent drawn to the circle at S. If SR = RB, show that $P\hat{Q}R = 3S\hat{P}R$



- 10) According to the given diagram, *PQRS* is a parallelogram. *QR* is produced to meet at *M* such that PS = MR. *PM* intersects *SR* at *T*.
 - i. Copy the diagram in your answer script and mark the

given data.

- ii. Show that area of PRMS = area of PQRS.
- iii. Show that area of ΔQTR = area of ΔSTM .
- iv. Show that PQ.PS = MQ.ST
- 11) A solid object (shaded part) as shown in the figure is obtained by removing a cone of radius r and height r from a large solid metal cone of radius2r and height 2r. By melting this solid, 9 identical

solid spheres of radius *a* can be made without wasting the metal. Show that $a^3 = \frac{7r^3}{2c}$

Taking r = 6.89 and using the logarithm tables find the value of a^3 to the nearest whole number and hence find the value of a?



- **12)** A survey was conducted among 65 students from an institution about the sports cricket, football and volleyball what they like.
 - 41 students like cricket.
 - All those who like football like cricket.
 - 5 students like football and cricket only.
 - 13 students like football.
 - 20 students like volleyball only.
 - Number of students who likes only cricket is equal to the number of students like football and cricket only.
 - i. Represent the above data in a suitable Venn diagram.
 - ii. How many students like all three sport items?
 - iii. How many students do not like any one of the above sport items?
 - iv. Shade the regions in the Venn diagram those who like only two sport items.

Ο

Μ



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පෙර පාසලේ සිට උසස් පෙළ දක්වා සියළුම පුශ්න පතු, කෙටි සටහන්, වැඩ පොත්, අතිරේක කියවීම් පොත්, සඟරා **සිංහල සහ ඉංගුසි වාධාණයන් ගෙදරටව ගෙන්වා ගැනීවට**

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