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Second Term Test - Grade 10 - 2023

MATHEMATICS - I

Time 02 hours

Name / Index No.

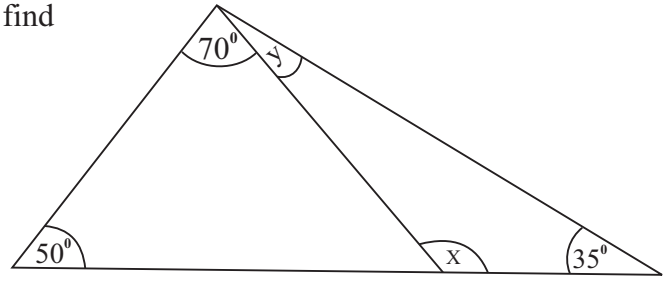
- **Answer all the questions on this paper itself.**
- **Indicate the relevant steps and the correct units when answering the question.**
- **Marks are awarded as follows,**
  In part A, 2 marks for each question. In Part B, 10 marks for each question

PART - A

01. The assessed annual value of a certain house is Rs. 30 000. If the relevant provincial council institution charges 15% of the value of the house as rates, calculate the rates that have to be paid for a quarter.

02. Factorize. $x^2 - 64$

03. According to the information given in the figure, find the value of x and y.

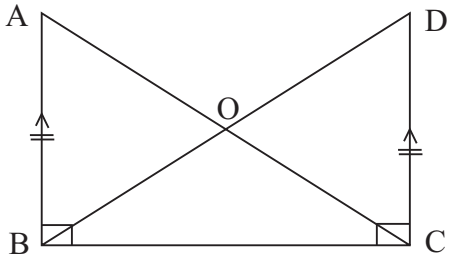


04. Find the least common multiple of the following algebraic terms.

$2x^2$, $4xy^2$, $5x^3y$

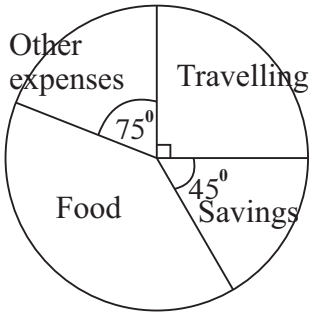
05. Simplify. $\frac{1}{2x} - \frac{2}{5x}$

06. Of the given figure, name a pair of congruent triangles and write down the case of congruency.

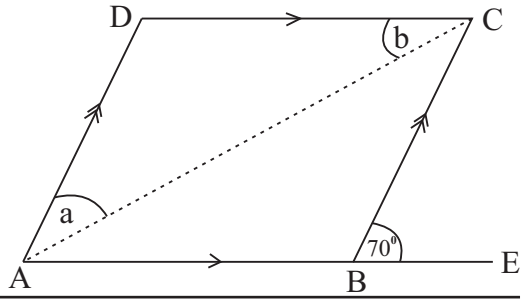


07. Write the gradient of the straight line which passess through the points (4, 6) and (2, 2)

08. The pie chart shows the manner in which Mr. Avishka spent his salary in a particular month. How many times of the amount of money he spent on food was the money he spent on other expenses?

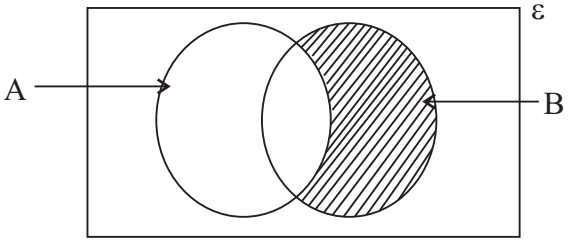


09. ABCD is a parallelogram. If $C\hat{B}E = 70^0$, find the values of a + b.



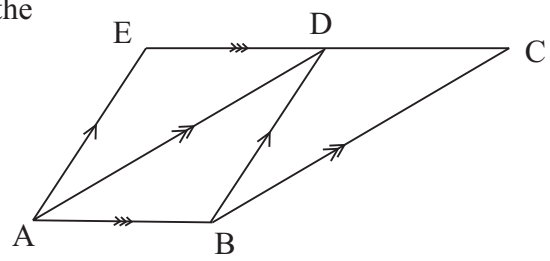
10. Solve, $\mathbf{x\,(x-1) = 0}$

11. Describe the shaded region in the given Venn diagram in set notation.



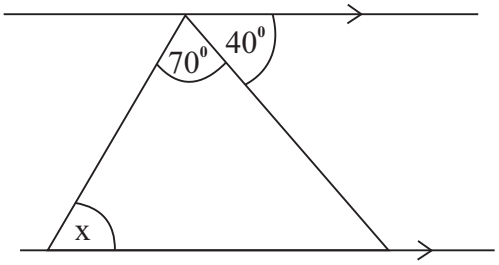
12. Express $\mathbf{10^{0.3010} = 2}$ in logarithm form.

13. If the area of the Δ DBC is 15 cm^2, find the area of the parallelogram ABDE.



14. Fill in the blanks, $x^2 + \ldots\ldots + 36 = (x + \ldots\ldots)^2$

15. According to the data given in the figure, find the value of x.



16. Out of the students in a certain class, 14 play Cricket and 16 play Elle. Find the probability of the randomly selected student is being a student who play cricket.

17. Water flows through a pipe at the rate of 40 litres per minute. How many minutes will it take to fill the tank of capacity 600*l*.

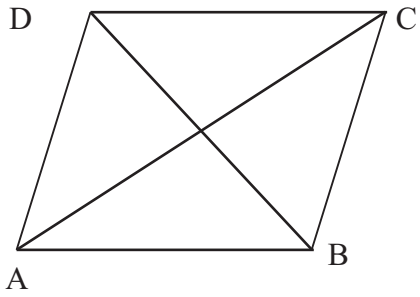
18. Without solving the following simultaneous equations, find the value of $x + y$.

$$3x + 4y = 13$$
$$2x + y = 2$$

19. Mark (✓) infront of the correct statement and mark (✗) infront of the incorrect statement

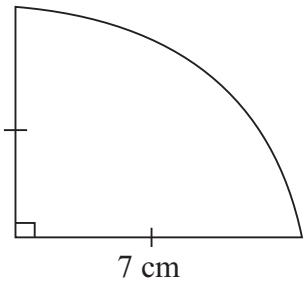
1. Sum of the two opposite angles of a parallelogram is always 180^0. ☐
2. If a side of a triangle is produced, the exterior angle so formed is twice the sum of the interior opposite angles. ☐
3. When a transversal intersects a pair of parallel lines, the each pair of allied angles formed is supplementary. ☐

20. ABCD is a Rhombus. If AC = 16 cm and BD = 12 cm, find the length of a side of the rhombus.

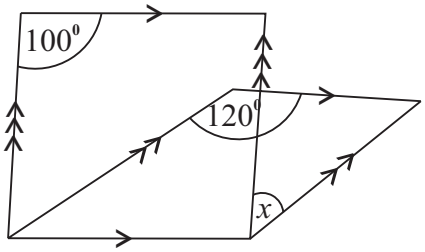


21. In between which two whole numbers does the value of $\sqrt{20}$ lie?

22. The circumference of a circle with the radius 7 cm is 44 cm. Find the perimeter of the given sector.



23. According to the information given in the figure, find the value of $\boldsymbol{x}$.

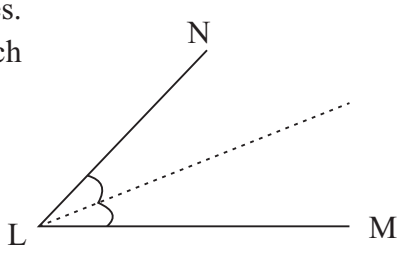


24. Assessment marks of 5 students are given below.

22, 20, 18, 12 and 16.

Find the median of the assessment marks.

25. The figure shows an incomplete sketch of a construction done to find the point P which is on the locus equidistance from the straight lines. LM and LN and 5cm away from the point L. Complete the sketch indicating how the location of the point P is found.



Part B

(01) (a) Mr. Nilupul spent $\frac{1}{4}$ of the total amount he has, to buy a land and spent $\frac{7}{20}$ of the total amount to construct a building.

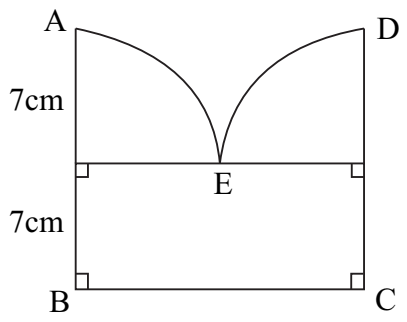
(i) What fraction of the total amount, he spent to buy the land and to construct the building.

(ii) After buying the land and constructing the building, $\frac{1}{4}$ of the remaining amount is invested in a business. What fraction of the total amount, he invested in the business?

(iii) At the end of the all these expenses, Rs. **240, 000** is left with him. Calculate the total amount of money he had at the begining.

(iv) Calculate the amount Mr. Nilupul invested in the business.

(02) A sketch of a birthday card prepared by a certain student is shown in the figure. It consists of a rectangle and two sectors with the same radii 7cm.



(i) Find the arc length **AE**.

(ii) Find the total area of the birthday card.

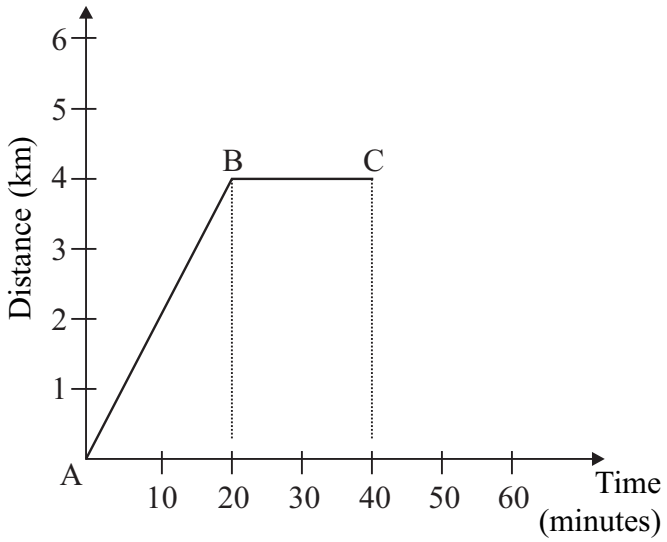
(iii) If it is proposed to paste a ribbon around the birth day card, calculate the length of the ribbon needed for this task.

(iv) Write down the ratio between the area of the rectangle and the area of the 2 sectors in the simplest form.

(03) How Pathum traveled from his home to the shop at the town to buy some goods and returned to his home, is shown in the given Distance-Time graph.

(i) How long did Pathum stay at the shop?

(ii) Find the speed at which he travelled from home to the shop in kilometers per hour.

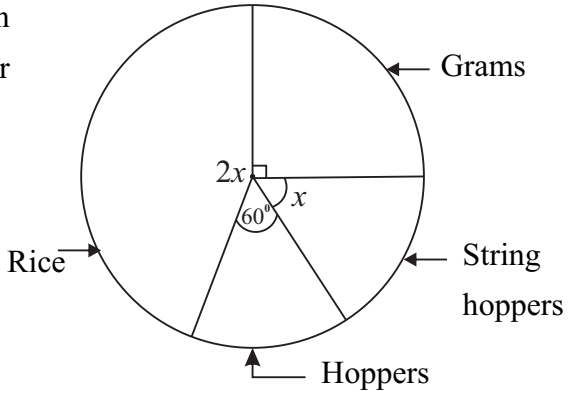


(iii) In his return journey from the shop to home, the speed was **24 kmh^{-1}** . How long did it take him to return from the shop to home.

(iv) Complete the given Distance-Time graph by including the answer in **(iii)** above of his return journey.

(04) The pie chart given in the figure shows, how a certain group of students bought various types of foods for their breakfast from the school canteen.

(i) Find the magnitude of the angle at the centre of the circle of the sector that represents the students who bought string hoppers?



(ii) If the number of students who brought grams 45, find the total number of students who bought breakfast from the canteen.

(iii) Find the number of students who bought rice?

(iv) By mistake, 5 students are recorded in the sector of Grams. But really 05 of them have bought string hoppers. If new pie chart is drawn find the angle at the centre of the sector that represents the number of students who bought Grams.

(05) (a) In a bag, there are 3 orange flovoured toffees and 2 apple flavoured toffees which are identical in all other aspects. Consider the experiment of randomly getting a toffee from the bag and recording its flavour.

(i) Write the sample space.

(ii) Find the probability of getting an orange flavoured toffee.

(iii) Find the probability of not getting an orange flavoured toffee.

(b) It takes 6 men 4 days to complete a certain task.

(i) What is the magnitude of the task in man days?

(ii) How many days are needed to finish thrice the above work by 8 men?

(iii) If the daily wage of a person is Rs. **1000**, calculate the total expenditure of the work in **(ii)**.

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Second Term Test - Grade 10 - 2023

MATHEMATICS - II

Time 03 hours
Extra reading time - 10 minutes.

Name / Index No.

Instruction :

- **Answer the 10 questions selecting five questions from part A and five questions from part B.**
- **Write the relavent steps and the correct units in answering the questions.**
- **Each question carries 10 marks.**

Part - A

(01) (a) An incomplete table prepared to draw the graph of the function $y = -ax^2 + b$ is given below.

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

(i) By considering the symmetry of the above table of values, obtain the value of y when x = (-2).

(ii) Using the standard system of axes and a suitable scale, draw the graph of the quadratic function on a graph paper based on the above table of values.

(b) Using your graph,

(i) Write down the co-ordinates of the turning point of the group.

(ii) Write down the range of values of x for which the function is positive.

(ii) Express the quadratic function in the form $y = -ax^2 + b$.

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(02) (a) The first Rs. 500 000 of the annual income of a person is free of income tax, the next Rs. 500 000 is subject to 4% income tax and the next Rs. 500 000 is subject to 8% income tax. Find the income tax that should be paid by a businessmen who earns and annual income of Rs. 1 250 000.

(b) Above businessman deposits exactly half of his annual income in a certain bank at an annual interest rate of 8%.

(i) Find the total amount he received, at the end of the 2 years.

(ii) Show that his annual income tax is less than the simple interest he received at the end of one year.

(03) (a) It costs Rs. 200 to buy a king coconut and 2 oranges 3 king coconuts can be bought for the price of 4 oranges.

(i) Construct a pair of simultaneous equations to represent the above information, by taking the price of a king coconut as Rs. x and the price of an orange as Rs. y.

(ii) By solving the pair of simultaneous equations and find seperately, the price of a king coconut and price of an orange.

(b) Simplify, $\frac{3}{x^2-1} - \frac{1}{x+1}$

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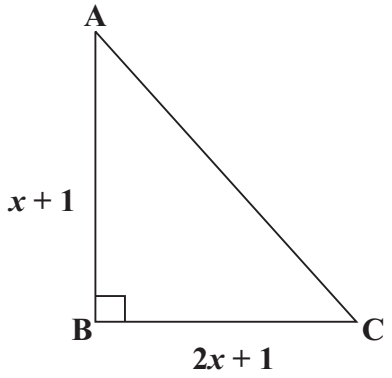
(04) The area of the above shown right angled triangle is $38.5cm^2$.

Construct a quadratic equation in terms of x and by solving it, find the length of the side **BC**.



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(05) (a) (i) Make **m** the subject of the formula $y = mx + c$.

(ii) If $x + y = 5$ and $xy = 6$, find the value of $x^2 + y^2$ using $(x+y)^2 = x^2 + 2xy + y^2$.

Hence, write down 2 suitable positive integral values for x and y.

(b) A pilot flies a plane **100 km** on a bearing of 050^0 and then, **100 km** on a bearing of 090^0 and arrives at airport **B** from airport **A**.

(i) Draw a rough sketch based on the above information.

(ii) Draw a scale diagram using a suitable scale.

(iii) Find the bearing **A** from **B**.

---

(06) The number of books loaned by a school library during a month of 30 days is given below.

Number of books	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44
Number of days	2	3	9	7	6	3

(i) What is the modal class?

(ii) Using the table, find the number of days in which 30 or more than 30 books have been loaned.

(iii) Find the median class.

(iv) Write down the number of days in which less than 35 books were loaned as a percentage of the total number of books loaned.

Part - B

(07) Sumith had arranged the certain set of cards as follows.

2, 5, 8, 11, ...

(i) Write down the next two terms of the above number sequence.

(ii) Find the general term of the above number sequence.

(iii) Hence, find the $\mathbf{50^{th}}$ term.

(iv) Which term of this number sequence is **59** ?

(v) By giving reasons show that weather **75** is a term of this number sequence.

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(08) Using a straight edge, a pair of compasses and a **cm / mm** scale and showing construction lines clearly, construct the geometric figure which satisfies the data given below.

(i) Construct the triangle **ABC** in which **AB = 8cm , BÂC = 90⁰** and **AC = 6 cm**.

(ii) Construct the perpendicular bisector of the side **AC** and name the point which it intersect **BC** as **O**.

(iii) Construct the circle by taking **O** as the centre and **OB** as the radius. Then measure the diameter and write down its value.

(iv) Calculate the length of the side **BC** by using the length of the sides **AB** and **AC**. Hence show that the answer taken in **(iii)** is satisfied with the length of the side **BC**.

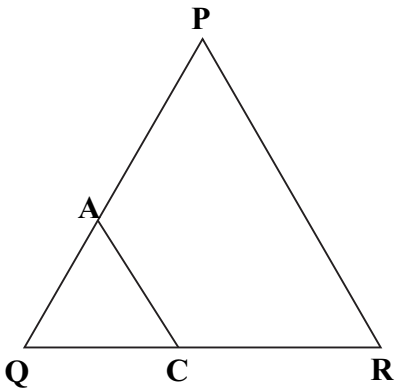
---

(09) **PQR** shown in the figures is a triangle, **PQ = PR**. Moreover, the straight line **PR** has been produced to **B** such that **QA = RB**.

Further **AC** is drawn parallel to **PB**.

(i) Copy the figure into your answer script and include the above information. Then prove that Δ **QAC** is an isosceles triangle.

(ii) Show that **ACBR** is a paralleogram.



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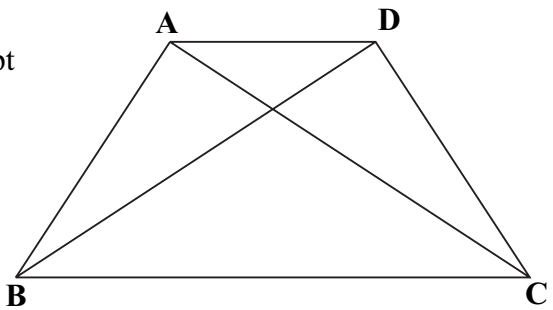
(10) In the given figure diagonals **AC** and **BD** of the quadrilateral **ABCD** intersect at the point **T**. Furthermore **AB = DC** and **AC = BD**.

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

(ii) Prove that **ΔABD ≡ ΔACD**.

(iii) Show that **BÂD = CD̂A.**

(iv) Show that **BT = TC.**



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(11) (i) Solve the following equation.

lgx + lg2 = lg16 - lg4

(ii) Simplify $\frac{125.4 \times 5.31}{12.5}$ using logarithmic tables and give the answer to the nearest first decimal place.

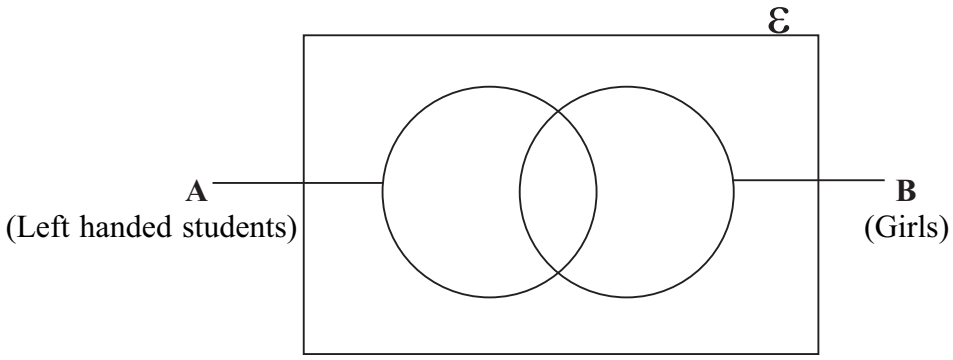
(12) Out of the **45** students in a certain mixed school, **7** students are left handed, **25** students are girls, **18** boys are right handed.

(i) Copy the incomplete Venn diagram given below in your answer script and represent the above information in it.

(ii) How many left handed boys and there?

(iii) Find the number of right handed students.

(iv) Shade the region $\mathbf{A}' \cap \mathbf{B}$ in the above Venn diagram and describes it in words.



(v) Write the probability of a randomly selected girl being a left handed out of the total number of students in the class.

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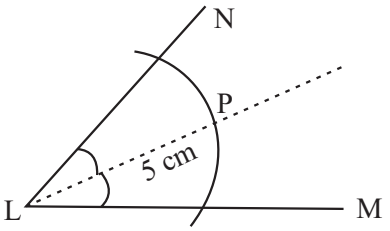
Department of Provincial Education - NWP
අවසාන වාර පරීක්ෂණය - 10 -11 ශ්‍රේණි - 2023
Second Term Test - Grade 10 -11 - 2023

ගණිතය II

විෂයය Subject	විභාග අංකය Index No.

විභාග ශාලාවෙන් පිටතට ගෙනයාම තහනම්. Not to be removed from the Examination Hall.

Paper I - Part - A

01.	Rs. 1125 30 000 x $\frac{15}{100}$ = Rs. 4 500	1	②
02.	(x - 8) (x+8) $x^2 - 8^2$	1	②
03.	$x = 120^0$ $y = 25^0$	1 1	②
04.	$20x^3y^2$ $2x^2 = 2 \times x \times x$ $4xy^2 = 2 \times 2 \times x \times y \times y$ $5x^3y = 5 \times x \times x \times x \times x \times y$	1	②
05.	$\frac{1}{10x}$ $\frac{5}{10x} - \frac{4}{10x}$	1	②
06.	ABC Δ, BCD Δ (S A S) or AOB Δ, COD Δ (A A S)		②
07.	$m = \frac{4}{2} = 2$		②
08.	Twice Angle at the centre = $360^0 - (75^0+90^0+45^0)$ of food = 150^0	1	②
09.	$a + b = 70^0$		②
10.	$x = 0$ and $x = 1$ $x = 0$ or $x - 1 = 0$	1 1	②
11.	$B \cap A^1$		②
12.	lg 2 = 0.3010		②
13.	Area of ABDE 30 cm^2 area of Δ ABD 15 cm	1	②
14.	$x^2 +$ [12x] $+ 36 = (x +$ [6] $)^2$		②
15.	70^0 Corresponding angles		②
16.	$\frac{14}{30}$		②
17.	minutes 15 Time = $\frac{600l}{40l \text{ min}^{-1}}$	1	②
18.	$x + y = 3$		②
19.	×, ×, ✓ 2 Correct answers	1 1	②
20.	10 cm		②
21.	4 and 5		②
22.	25 cm		②
23.	$x = 20^0$ Taking opposite angles	1	②
24.	18		②
25.			②
			50

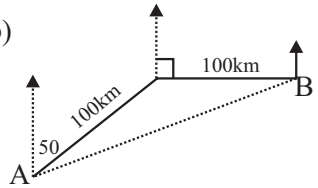
Paper I - Part B

01	(i) $\frac{1}{4} + \frac{7}{20}$ $= \frac{5+7}{20}$ $= \frac{12}{20} = \frac{3}{5}$	01 01	02
	(ii) $\frac{5}{5} - \frac{3}{5} = \frac{2}{5}$ $\frac{2}{5}$ of $\frac{1}{4}$ $\frac{1}{10}$	01 01	03
	(iii) $1 - \left(\frac{3}{5} + \frac{1}{10}\right)$ $\frac{10}{10} - \frac{7}{10}$	01	

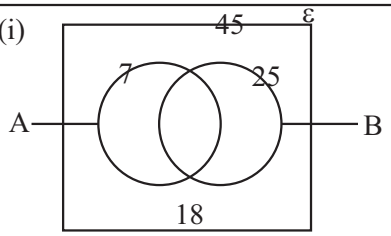
	$\frac{3}{10} \longrightarrow 240\,000$		
	$\frac{10}{10} \longrightarrow \frac{240\,000}{3} \times 10$	01	
	= Rs. 800 000	01	03
	(iv) $\frac{800\,000}{10}$	01	
	= Rs. 80 000	01	02
			10
02	(i) $2 \times \frac{22}{7} \times 7 \times \frac{1}{4}$	01	
	= 11 cm	01	02
	(ii) $14 \times 7 + 2\left(\frac{22}{7} \times 7 \times 7 \times \frac{1}{4}\right)$	02	
	98 + 77	01	
	175 cm^2	01	04
	(iii) $7 \times 6 + 11 \times 2$	01	
	42 + 22		
	64	01	02
	(iv) $14 \times 7 : 77$	01	
	14 : 11	01	02
			10
03	(i) 20 minutes		02
	(ii) Speed = $\frac{\text{Distance}}{\text{Times}}$	01	
	$= 4\text{ km} \div \frac{20}{60}$	01	
	$= 12\text{kmh}^{-1}$	01	03
	(iii) $24 = 4 \div \frac{t}{60}$	01	
	$t = 4 \times \frac{60}{24}$	01	
	10 minute	01	03
	(iv) Distance 8 6 4 2 10 20 30 40 50 Time		02
			10

04	(i) $90 + 60 + x + 2x = 360$	01	
	$x = 70$	01	02
	(ii) $90^0 \rightarrow 45^0$	01	
	$360^0 \rightarrow 45^0 \times 4$	01	
	= 180	01	02
	(iii) $\frac{45}{90} \times 140$	01	
	= 70	01	02
	(iv) 45 - 5	01	
	$\frac{40}{180} \times 360$	02	
	= 80	01	04
			10
05	(a) (i) S = {D_1, D_2, D_3, A_1, A_1,}	02	
	(ii) $\frac{3}{5}$	01	
	(iii) $\frac{2}{5}$	01	04
	(b) (i) $6 \times 4 = 24$		01
	(ii) 24×3	01	
	$\frac{24 \times 3}{8} = 9$	01	02
	(iii) 1000×8		
	8000	01	
	8000×9	01	
	රු. 72 000	01	03
			10

	Paper II - Part - A		
01	(i) y = 1		01
	(ii) Axes, Points, Curves		03
	(iii) (0,5)		02
	(iv) -2.2 <x<2.2		02
	(v) $y = -ax^2 + 5$		
	$4 = -a \times 1^2 + 5$		
	a = 1	01	
	$y = -x^2 + 5$	01	02
			10
02	(a) $\frac{4}{100} \times 500\,000 = 20\,000$	1 + 1	
	$\frac{8}{100} \times 250\,000 = 20\,000$	01	
	Total income tax = 20 000 + 20 000		
	Rs. 40 000	01	04
	(b) (i) $\frac{8}{100} \times 625\,000 \times 2 = 100\,000$	1 + 1	
	Total amount = 625 000 + 100 000	01	
	= 725 000	01	04

	(ii) Income tax = 40 000 Simple interest = 50 000 40 000 < 50 000	01 01	02
			10
03	(a) (i) $x + 2y = 200$ —— (1) $3x - 4y = 0$ —— (2)	01 01	02
	(ii) (1) × 2 $2x + 4y = 400$ - (3)	01	
	(2) + (3) $5x = 400$	01	
	$x = 80$	01	03
	$2y = 200 - 80$		
	$y = 60$	01	
	King coconuts = 80		
	Oranges = 60	01	02
	(b) $\frac{3}{(x+1)(x-1)} - \frac{1}{x+1}$		
	$= \frac{3 - (x-1)}{(x+1)(x-1)}$	01	
	$= \frac{3 - x + 1}{(x+1)(x-1)}$	01	
	$\frac{4 - x}{(x+1)(x-1)}$	01	03
			10
04	$\frac{1}{2}(2x + 1)(x+2) = 38.5$	1+1	
	$(2x + 1)(x+2) = 77$	01	
	$2x^2 + 5x - 75 = 0$	01	
	$(2x + 15)(x - 5) = 0$	1+1	
	$2x + 15 = 0$ or $x - 5 = 0$	01	
	$x = 5$	01	
	x can't be a negative value	01	
	BC length = 5 × 2 + 1	01	
	= 11		**10**
05	(a) (i) $y - c = mx$	01	
	$\frac{y - c}{x} = m$	01	02
	(ii) $(x+y)^2 = x^2 + 2xy + y^2$		
	$5^2 = 2 \times 6 + x^2 + y^2$	01	
	$25 - 12 = x^2 + y^2$		
	$13 = x^2 + y^2$	01	
	$x = 2$, $y = 3$	01	03
	(b) 		01

	(ii) Correct scale	01	
	Correct angle and distance.	1+1	
	(iii) Bearing of A from B.	01	05
			10
06	(i) Modal class = 25 - 29		02
	(ii) Number of days = 16		02
	(iii) Median calss $= \frac{1}{2} + (30 + 1)$	01	
	$= 15.5$	01	
	$= 30\text{-}34$	01	03
	(iv) Percentage $= \frac{21}{30} \times 100$	1+1	
	$= 70\ \%$	01	03
			10
	Paper II - Part B		
06	(i) 14, 17	1+1	02
	(ii) $T_n = 3n - 1$		02
	(iii) $T_{50} = 3 \times 50 - 1$	01	
	$= 150 - 1$		02
	$= 149$	01	
	(iv) $59 = 3n - 1$	01	
	$60 = 3n$		
	$20 = n$	01	02
	(v) $75 = 3n - 1$		
	$76 = 3n$		
	$\frac{73}{3} = n$		
	$n = 25\frac{1}{3}$	01	
	75 is not a term because n is a fraction.	01	02
			10
08	(i) Drawing AB and AC	01	
	Constructing $B\hat{A}C$	02	
	completing the triangle	01	04
	(ii) Perpendicular bisector		02
	(iii) Constructing circle.	01	
	Measuring the diameter	01	02
	(iv) Using the pythagarous theorem	01	
	find the length AC	01	02
			10
09	(i) Drawing the diagram and marking data	01 01	
	$A\hat{Q}C = P\hat{R}C$ (PQ = PR)	01	
	$P\hat{R}Q = A\hat{C}Q$ (Corresponding angle)	01	
	$\therefore\ P\hat{Q}R = A\hat{C}Q$	01	05
	$\therefore$ Isosceles triangle AQC		

	(ii) AQ = AC (Isosceles Δ AQC)	01	
	AQ = RB (data)	01	
	∴ AC = RB	01	
	Further AC // RB (data)	01	
	ACBR ▱	01	
	(A pair Opposite side is equal & parallel.)		05
			10
10	(i) Drawing & making data.		01
	(ii) ABDΔ and ACDΔ		
	AB = DC (data)	01	
	BD = AC (data)	01	
	AD	01	
	∴ ABDΔ ≡ ACDΔ (S S S)	01	04
	(iii) $B\hat{A}D = C\hat{D}A$ (Properties of congruent triangles)		01
	(iv) $A\hat{D}B = D\hat{A}C$ (Properties of congruent triangles)	01	
	∴ AT = TD	01	
	AC = BD (data) ∴ AC - AT = BD - TD ∴ TC = BT	02	04
			10
11	(i) lg x + lg 2 = lg 16 - 1g 4		
	lg (x × 2) - lg (16/4)	01	
	2x = 4	01	
	x = 2	01	03
	(ii) lg 125.4 + lg 5.31 - lg 12.5	01	
	2.0983 + 0.7251 - 1.0969	02	
	2.8234 - 1.0969	01	
	1.7265 antilog	01	
	53.27	01	
	53.3	01	07
			10
12	(i) 		
	45, 7, 25, 18 (3 correct answers)		03
	(ii) 45 - (25 + 18)	01	
	= 2	01	02
	(iii) 20 + 18		
	38	01	01
	(iv) shading	01	
	Writing in words	01	02
	(v) $\frac{5}{45} \times \frac{1}{9}$	02	02
			10

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නිවසටම ගෙන්වා ගන්න

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කෙටි සටහන්, වැඩ පොත්, අතිරේක කියවීම් පොත්, සඟරා
සිංහල සහ ඉංග්‍රීසි මාධ්‍යයෙන් ගෙදරටම ගෙන්වා ගැනීමට

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