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PROVINCIAL DEPARTMENT OF EDUCATION NORTH WESTERN PROVINCE

THIRD TERM TEST - 2020

Grade 11 **MATHEMATICS - I** **02 Hours**

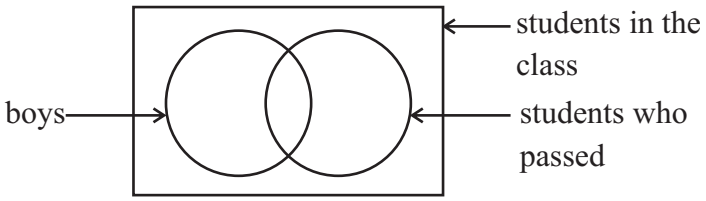
Name / Index No. :

- **Answer all the questions on this paper itself.**
- **Each question carries two marks in Part A and 10 marks for each question in Part B.**

PART - A

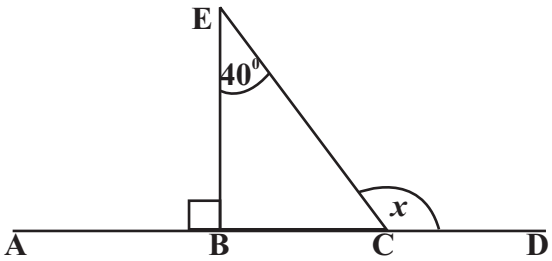
01. The assessed annual value of a house, within the administrative domain of a certain provincial council, is **Rs. 48000**. If the annual rates charged on this house is, **Rs. 1080**, calculate the rates percentage.

02. The following Venn diagram denotes how the students of a certain class, passed an examination. Shade the region relevant to the girls who failed the exam.



03. Denote in the index form. $\log_3 243 = 5$

04. **ABCD** is a straight line in the given figure. Find the value of x^0, with the data provided.

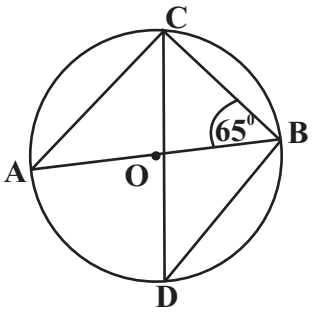


05. Factorize. $2x^2 - x - 3$

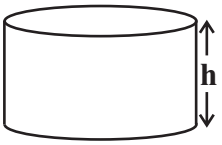
06. **600** litres of water, flows through a pipe within **10** minutes. Find the rate of water flow of that pipe in litres per second.

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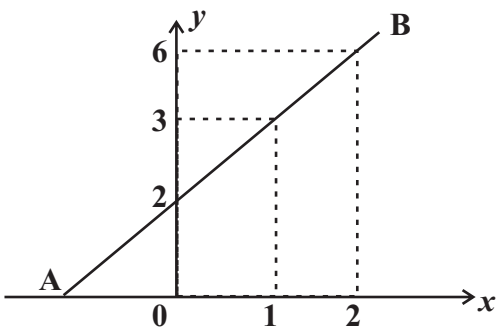
07. **AB** is a diameter of the circle with centre '**O**'. $\hat{ABC} = 65^0$. Find the value of $\hat{BDC}$.



08. If the circumference of the base of the given right cylinder is **22 cm** and the surface area of the curved surface is **220 cm²**, Find the value of ***h***.

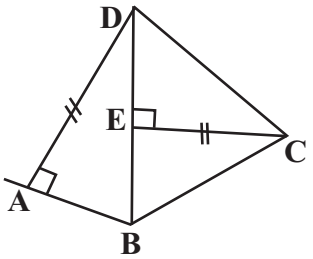


09. In the **AB** straight line, given in the figure,
    (i) Find the gradient
    (ii) Write the equation of the straight line.



10. Simplify. $\frac{3x}{2} \quad \frac{3}{4x}$

11. In the given figure, $\hat{ABC}$ is bisected by **BD** and **AD = EC**. Name two triangles which are congruent and state the case of congruency.

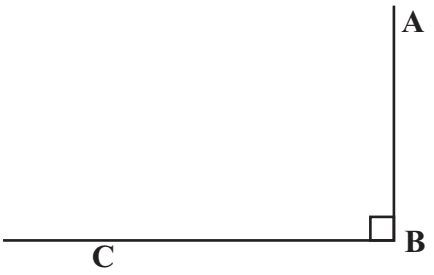


12. Solve. $2x^2 - 32 = 0$

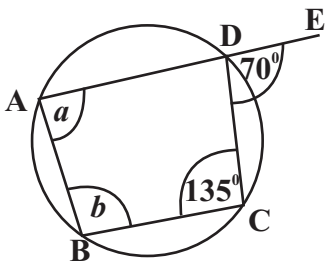
13. In the building **AB**, the top most floor is **A** and the bottom is **B**. When observed from **A**, a car parked at point **C** on the horizontal ground can be seen with an angle of depression of **42º**.

(i) Show the given data in the sketch.

(ii) Denote **tan 42º** using the sides.



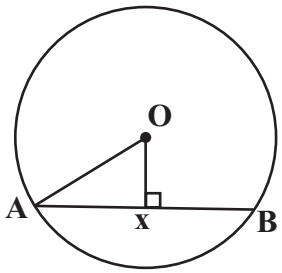
14. In the given figure, **ABCD** is a cyclic quadrilateral. **AD** is produced upto **E**. Find the values of a and b.



15. Find the least common multiple. $4a^2$, $2ab$, $3b^2$

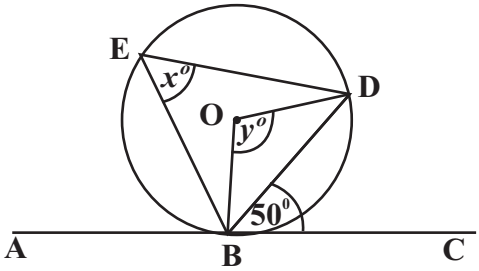
16. In the geometric progression with **2** as the first term and also the common ratio, denote the **15th** term as a power of **2**.

17. The radius of the circle with centre '**O**' is **13 cm**. **AB** is a chord and **OX** $\perp$ **AB**. If **OX = 5 cm**, Find the length of **AB** chord.



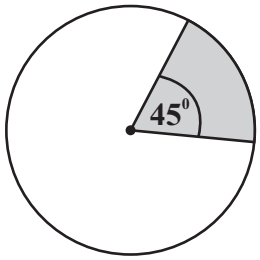
18. If $\mathbf{A} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ **and** $\mathbf{B} = (2\ 1)$, find **AB**

19. **AC** is a tangent to the circle with centre '**O**'. If $\hat{CBD} = 50^o$, find the values of x and **y**.



20. There are **28** pencils of same shape and size, in a box. Some of them are red in colour and the rest is yellow. If the probability of a pencil randomly drawn out, being yellow, is $\frac{3}{7}$, find the number of red pencils in the box.

21. Find the arc length of the shaded region of the circle with radius **21 cm**.



22. Find the number of days needed for **8** men to complete, twice of a work done by **4** men in **7** days.

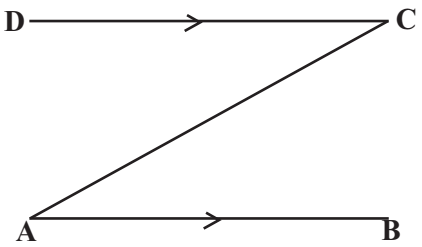
23. Consider the following statements and put (✓) or (✗) in the boxes provided.

(i) The diagonals of a parallelogram, are bisected perpendicularly. ☐

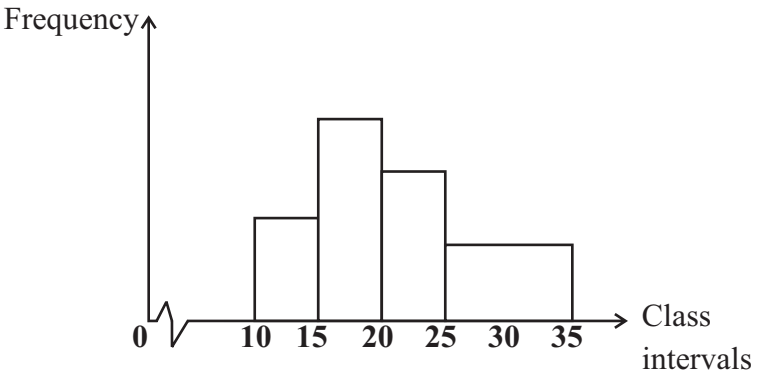
(ii) If the opposite sides of a quadrilateral are equal and parallel, it is a parallelogram. ☐

(iii) The diagonals of a rhombus, bisect its area. ☐

24. The locus of points equidistant from **AB** is **CD**. Sketch the point **M**, which lies on **CD** and which is equidistant from **A** and **C**, by using the knowledge about loci.



25. Draw the frequency polygon on the histogram given below.

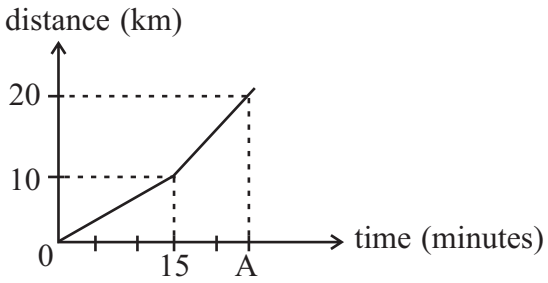


(01) (a) In a certain Pradeshiya Sabha, (Local Government office) $\frac{3}{7}$ of the funds received by it, is allocated for development purposes and the rest is distributed equally among three Grama Niladhari Divisions.

(i) What fraction of the total amount is given for a Grama Nilashari division ?

(ii) If a Grama Niladhari division gets Rs. 800 000, what was the amount allocated for the development purposes of the Pradeshiya Sabha ?

(b) The following distance - time graph denotes the way that Mr. Rohana travelled in his motor bike to the city.



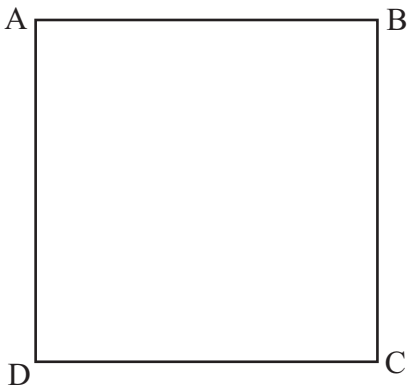
(i) Find the speed of the bike in the first 15 minutes, in kmh^{-1}.

(ii) If Mr. Rohana travelled with a speed, of $60kmh^{-1}$ in the last 10 km, find the time taken for it and find the value of A, in the graph.

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(02) In the given figure, ABCD is a square shaped metal sheet of area $196cm^2$. Maximum number of sectors with radius 7 cm and 45^o of angle at the centre, is going to be removed from it.

(i) Find the length of one side of the square sheet.



(ii) Draw a sketch of a sector that is going to be removed from the square sheet, by taking DC as one side and angle at the centre, on D vertex. (Include the measurements)

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(iii) In a sector that is going to be removed,

(a) find the arc length.

(b) find the area.

(iv) Find the perimeter of the remaining metal sheet after removing one sector.

(v) Estimate how many sectors can be removed from the ABCD metal sheet.

(03) (a) In a certain Private Limited company which pays annual dividends of Rs. 6 per share, Mr. Priyanjana invested Rs. 50 000 and received a dividend income of Rs. 15 000.

(i) How many shares have been bought by Mr. Priyanjana in the above company ?

(ii) Find the selling price of a share in the company.

(iii) After receiving the dividend income, Mr. Priyanjana sold all the shares for Rs. 60 000. Write the percentage of the capital gain to the amount he invested in the company.

(b) The assessed value of a house in a certain administrative division is Rs. 80 000. The annual rate percentage charged on it is 6%.

(i) What is the amount of rates charged for one year ?

(ii) What is the amount of rates charged for a quarter ?

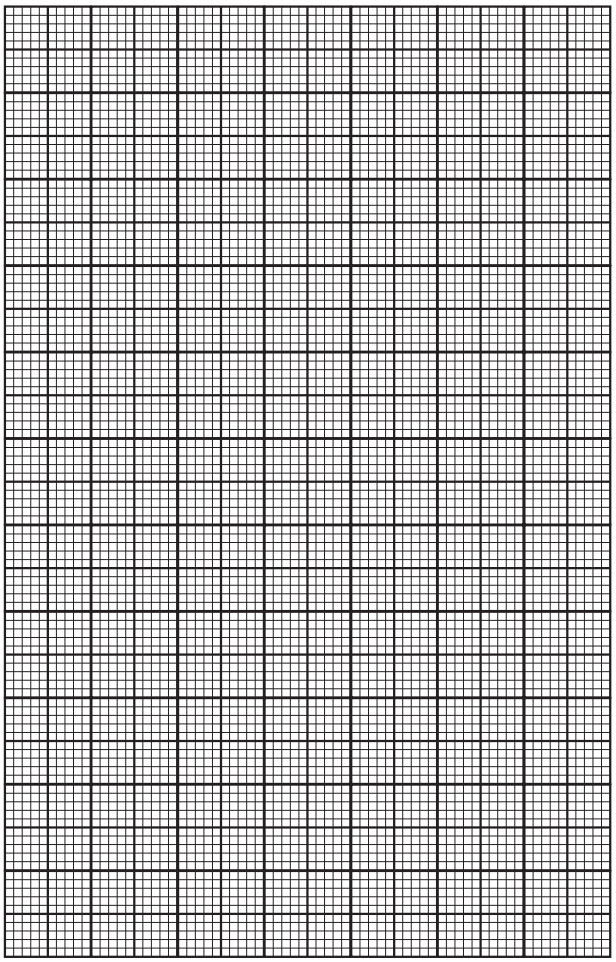
(04) (a) The amount paid for school vans by students in a certain month is given in the table given below.

Amount paid (Rs.)	No. of students	Cumulative frequency
0 - 1000	4	
1000 - 2000	3	
2000 - 3000	5	
3000 - 4000	7	
4000 - 5000	3	
5000 - 6000	2	

(i) Complete the cumulative frequency column in the above table.

(ii) By taking a suitable scale, draw the cumulative frequency curve.

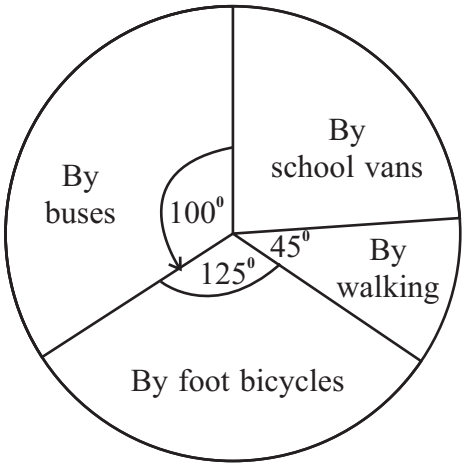
(iii) Find the median amount paid by a student, by using the cumulative frequency curve.



(b) The methods of coming to school by a certain set of students is given in the pie chart.

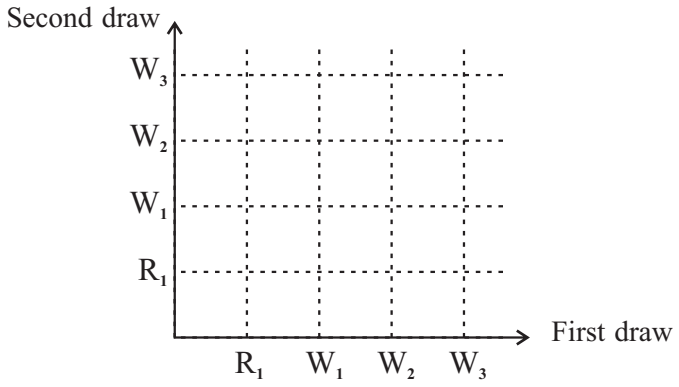
(i) If the number of students, who come to school by school vans, is 24, find the no. of students who walk to school.

(ii) What fraction of students come to school by buses ?



(05) (a) 3 white hair pins and 1 red hair pin of same shape and size, are in a box. Namali takes one hair pin out, randomly and gives it to her sister. Namali then takes another hair pin for herself.

(i) Represent all the possible outcomes in the given grid.

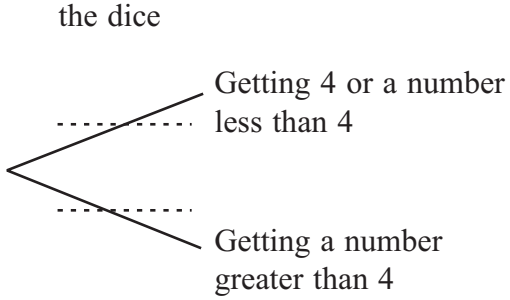


(ii) Mark all the events of taking two hair pins with different colours and write the probability of it.

(iii) If Namali replaced the hair pin of the first draw and then took another hair pin, show that the probability of the above question is 37.5%.

(b) There are 2 red pens and a blue pen in box A and 3 red pens and 2 blue pens in box B. The pens are of the same shape and size. A student tosses an unbiased dice with the faces marked from 1 to 6. If the dice gives number 4 or a number less than 4, a pen from box A is taken out. If the dice gives a number greater than 4, a pen from box B is taken out.

(i) Complete the blanks in the given tree diagram.



(ii) Extend the given tree diagram according to the events of taking out a pen from box A and box B.

(iii) Write the probability of getting a red pen.

“The roots of education are bitter, but the fruit is sweet.” — Aristotle (commonly attributed)

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PROVINCIAL DEPARTMENT OF EDUCATION NORTH WESTERN PROVINCE

THIRD TERM TEST - 2020

Grade 11 MATHEMATICS - II 03 Hours

Name / Index No. :

- **Answer 10 questions by selecting 5 questions from part A and 5 questions from part B.**
- **Write relevant steps and correct units in the answers.**
- **Each question carries 10 marks.**
- **The volume of a right cylinder with base radius r and height h, is r^2h.**

Part - A

(01) An incomplete table to draw the graph of the function $y = x\,(x - 4) - 1$ is given below.

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

(a) (i) Find the value of y when $x = 2$.

(ii) Draw the graph of the above function by taking a suitable scale.

(b) From the graph,

(i) Write the coordinates of the turning point.

(ii) Write the interval of values of x when the function is negative.

(c) (i) Find the roots of the equation $x^2 - 4x - 1 = 0$ using the graph.

(ii) Write the equation of the function when the above graph is displaced up by one unit, in the form $y = (x - a)^2 + b$

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(02) A survey was conducted by using 50 employees who assemble electric equipments in a certain company. The time taken to assemble one electric equipment and the relevant no. of employees is given in the table below.

Time taken to assemble one equipment (minutes)	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49
No. of employees	4	7	18	12	06	03

(i) Write the modal class.

(ii) Find the mean time to assemble one electric equipment to the nearest whole number and show that the number of employees needed to assemble 1440 equipments in an eight hour shift, is more than 100.

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(03) The following table shows how two shops sell the same electric equipment for the customers.

Shop	Market Price (Rs.)	Down Payment (Rs.)	No. of Monthly Installments	Loan amount to be paid monthly (Rs.)
A	35 000	7 000	10	.....
B	34 500	6 500	.....	2 800

(i) Copy the given table in your answer sheet and complete the blanks.

(ii) Find the number of month units that the interest has to be paid by a person who bought the equipment from shop A.

(iii) If the interest for a month unit in shop A is Rs. 35, find the monthly installment in shop A.

(iv) If shop B charges, Rs. 42 of interest for one month unit, find the annual interest percentage of shop B.

(04) Figure A shows a square shaped metal sheet with length x cm. Figure B shows a rectangular metal sheet which is obtained by removing 2 cm from one side of the square sheet and adding 4 cm to the other side of the square sheet.

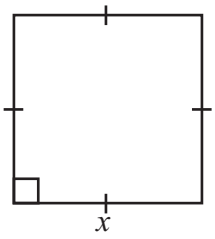


Figure A

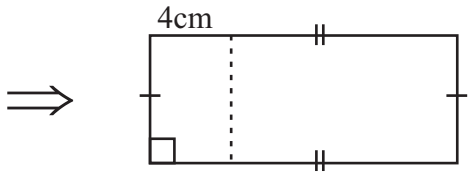


Figure B

(i) Write the length and breadth of the rectangular metal sheet.

(ii) If the area of the rectangular sheet is 41cm^2 , construct a quadratic equation using x in the form of $ax^2 + bx + c = 0$

(iii) By completing the square or using any other method, show that the length of a side of the square is $5\sqrt{2} - 1$

(iv) By taking $\sqrt{2} = 1.41$, find the length of the rectangle.

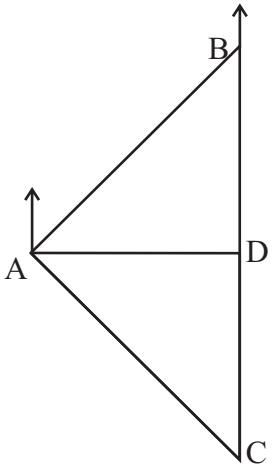
(05) (a) Simplify. $\frac{1}{4x + 4} - \frac{1}{5x + 5}$

(b) Sujatha buys kids shirts for Rs. 180 each and kids trousers for Rs. 150 each by spending Rs. 2940. She then sells kids shirts for Rs. 280 each and kids trousers for Rs. 300 each and gains a profit of Rs. 2300.

(i) By taking the number of kids shirts she bought as 'a' and number of kids trousers as 'b', construct a pair of simultaneous equations.

(ii) By solving them, find the number of kids shirts and kids trousers that Sujatha bought.

(06) A ship which leaves harbour A, sails for 50 km with a bearing of 035º and reaches harbour B. Then it sails from harbour B to harbour C with a bearing of 180º.



(i) Show the data in the given sketch diagram.

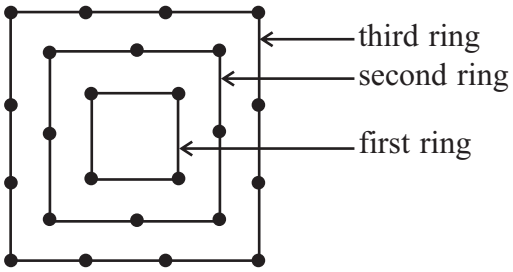
(ii) The perpendicular distance from A to BC, is AD. Find the distance AD by using trigonometric ratios.

(iii) If DC = 20 km, Find the value of $A\hat{C}D$.

(iv) By using $A\hat{C}D$, find the bearing of harbour A, from harbour C.

Part - B

(07) (a) The following figure shows how some chillie plants are grown in square shaped rings.



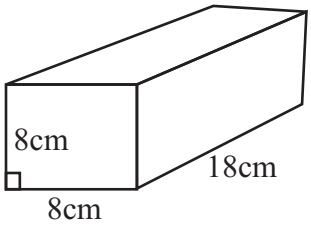
(i) When the number of plants in the first, second and third rings are considered, in which type of a progression can they be written as consecutive terms ?

(ii) In which ring is 48 chillie plants are grown ?

(iii) What is the total number of chillie plants in 12 rings ?

(b) In the geometric progression 3, -6, 12, ... which term is 192 ?

(08) (a) The figure shows a cuboidal metal block with cross sectional area as 8 cm x 8 cm and length 18 cm. This metal block is melted and without wasting any metal , 9 metalic cylinders are made with radius 'a' and height 7 cm. Show that $a = \frac{8}{\sqrt{11}}$



(b) By using logarithm tables, find the value of 'a' to the nearest second decimal place.

(09) Construct the followings by using only a straight edge with cm/mm scale and a pair of compasses. Show your construction lines clearly.

(i) Construct the ABC triangle with AB = 7 cm, $A\hat{B}C = 60º$ and BC = 5.5 cm.

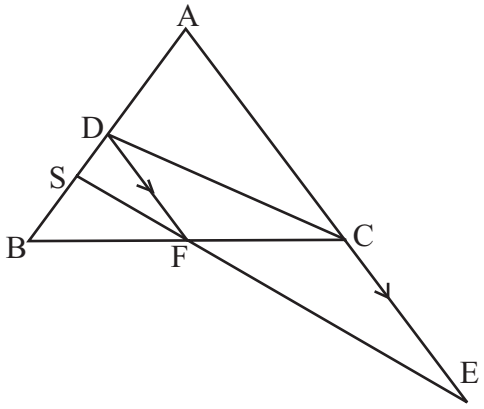
(ii) Extend AB upto E, and construct the locus of points equidistant from BE and BC.

(iii) Mark the point of intersection of the above locus and the bisector of $B\hat{A}C$ as O and construct the perpendicular OD, from O to BE.

(iv) Construct the circle which touches BE at D and also the BC side.

(v) Write the reason for the extended AC to become a tangent to the circle with centre 'O'.

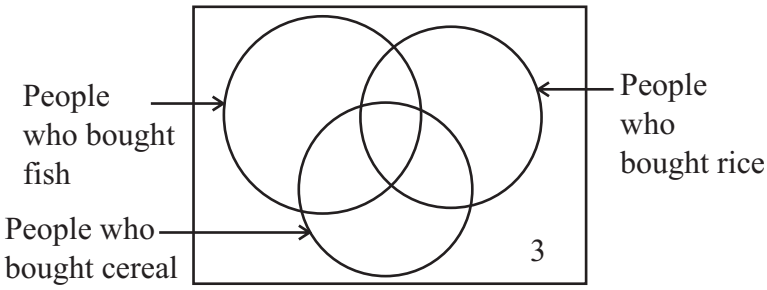
(10) In the ABC triangle, AB = AC and the midpoint of AB is D. AC is produced upto E so that AD = CE. And also CE // DF and when EF is produced, it meets AB at S.



(i) Show that CEFD is a parallelogram.

(ii) Prove that 4BS = AB.

(11) The following Venn diagram shows the details about customers who came to a super market within an hour and the things they bought such as fish, rice and cereal.



(i) Copy the given incomplete Venn diagram in your answer sheet and include the data given below.

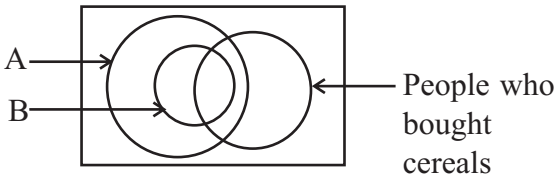
- No. of people who bought rice, is 20 and the no. of people who bought only cereals, is 4.
- 6 people bought only rice and out of the 12 people who bought rice and fish, 4 people didn't buy cereals.
- 16 people bought fish and one person bought fish only.

(ii) How many people who came to the super market, bought cereal ?

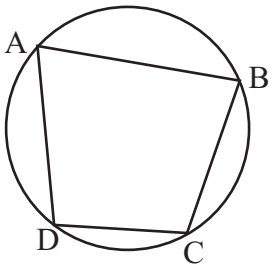
(iii) If Mr. Sumith bought rice and fish only, shade the region which denotes it.

(iv) What is the total number of customers who came within the hour ?

(v) If all the people who bought fish, also bought rice, name A and B in the new Venn diagram.



(12) ABCD is a cyclic quadrilateral. The tangent which is drawn to the circle at C, meets the extended AB side at E. The bisector of $A\hat{D}C$ is DB and AC and DB intersect at F.



(a) (i) Copy this figure in your answer sheet and include the given data.

(ii) If $C\hat{B}E = a$, express the given angles by a, and give reasons too.

(a) $B\hat{D}C$ (b) $B\hat{C}F$

(b) (i) Prove that ADF triangle and BCF triangle are equiangular triangles.

(ii) If 5 BC = 4 AD and DF = 4 cm, find the length of CF.

සියලුම හිමිකම් ඇවිරිණි. / All Rights Reserved.

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Department of Provincial Education - NWP

තෙවන වාර පරීක්ෂණය - 10 -11 ශ්‍රේණි - 2020

Third Term Test - Grade 10 -11 - 2020

ගණිතය II

විෂයය Subject	විභාග අංකය Index No.								

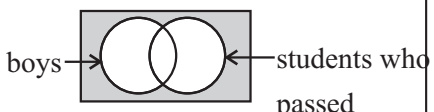
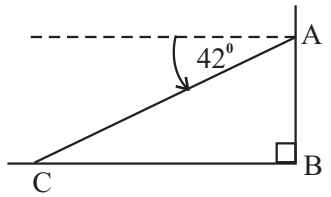
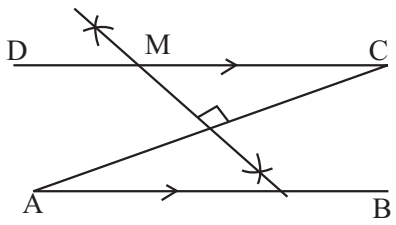
විභාග ශාලාවෙන් පිටතට ගෙනයාම තහනම්. Not to be removed from the Examination Hall.

“The roots of education are bitter, but the fruit is sweet.” — Aristotle (commonly attributed)

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ANSWER SHEET

Paper - I - Part A

01.	2.25% $\frac{1080}{48\,000}$ x 100%	 01	02
02.			02
03.	$3^5 = 243$		02
04.	$x = 130^0$ Obtaining $B\hat{C}E = 50^0$	 01	02
05.	$2x^2 - 3x + 2x - 3$ $x(2x - 3) + 1(2x - 3)$ $(2x - 3)(x + 1)$	01 01	02
06.	$1\ ls^{-1}$ Obtaining $\frac{600}{60 \times 10}$		02
07.	$B\hat{D}C = 25^0$ Obtaining $A\hat{C}B = 90^0$ or $B\hat{A}C = 25^0$	 01	02
08.	$h = 10$cm Obtaining $2\ rh = 220$ or $\frac{220}{22}$	 01	02
09.	$m = 3$ $y = 3x + 2$	01 01	02
10.	$2x^2$ $\frac{3x}{2}$ x $\frac{4x}{3}$	 01	02
11.	ABD BCE case of congruency (AAS)	01 01	02
12.	$2x^2 = 32$ $x^2 = 16$ $x = \pm 4$	 01 01	02
13.	 $\tan 42^0 = \frac{AB}{BC}$	 01 01	02
14.	$b = 70^0$ $a = 45^0$	01 01	02
15.	$12\ a^2b^2$		02
16.	$T_{15} = 2 \times 2^{(15-1)}$ $= 2 \times 2^{14}$ $= 2^{15}$	 01 01	02
17.	AB = 24cm Obtaining AX = 12cm	 01	02
18.	$\begin{pmatrix} 6 & -3 \\ 8 & -4 \end{pmatrix}$		02
19.	$x = 50^0$ $y = 100^0$	01 01	02
20.	16 $\frac{4}{7}$ x 28	 01	02
21.	16.5cm $2 \times \frac{22}{7} \times 21 \times \frac{45}{360}$	 01	02
22.	7 days 4 x 7 = 28 or obtaining 56	 01	02
23.	× ✓ ✓		02
24.	 Drawing the perpendicular bisector of AC / marking M	 01 01	02
25.	Drawing the correct frequency polygon		02
			50

Paper - I - Part B

01.	(a) (i) For Grama Nilashari divisions $= 1 - \frac{3}{7}$ $= \frac{4}{7}$	 01	
	(ii) For one Grama Nilashari division $= \frac{4}{7} \times \frac{1}{3}$ $= \frac{4}{21}$	01 01	

Total amount of funds $= \frac{4}{21}$ 800 000 — 01

$= \frac{800\,000}{4} \times 21$ — 01

$=$ Rs. 4 200 000

Development of Pradeshiya Sabha

$\frac{3}{7}$ x Rs. 4 200 000

$=$ Rs. 1 800 000 — 01 — 06

(b) (i) speed $= \frac{10}{\frac{15}{60}}$ km h — 01

$= 10 \times \frac{60}{15}$ kmh^{-1}

$= 40$ kmh^{-1} — 01

(ii) time $= \frac{10}{60} \times 60$ minutes — 01

$= 10$ minutes

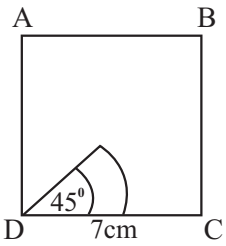
A = 25 — 01 — 04

10

02. (i) length of a side $= \sqrt{196}$

$= 14$cm — 01

(ii)



— 02

(ii) (a) arc length $= 2 \times \frac{22}{7} \times 7 \times \frac{1}{8}$

$= 5.5$cm — 02

(b) area $= \frac{22}{7} \times 7 \times 7 \times \frac{1}{8}$

$= 19.25\text{cm}^2$ — 02

(iv) perimeter $= 14 + 14 + 14 + 7 + 7 + 5.5$

$= 61.5$cm — 02

(v) 9 pieces — 01 — **10**

03. (a) (i) no. of shares $= \frac{15\,000}{6}$

$= 2\,500$ — 02

(ii) selling price per share $= \frac{50\,000}{2\,500}$

$=$ Rs. 20 — 02

(iii) Capital gain

$= 60\,000 - 50\,000$

$= 10\,000$ — 01

percentage $= \frac{10\,000}{50\,000} \times 100$

$= 20\%$ — 01 — 06

(b) (i) annual rate

$= \frac{6}{100} \times 80\,000$

$= 4\,800$ — 02

(ii) quarterly $= \frac{4\,800}{4}$

$=$ Rs. 1200 — 02 — 04

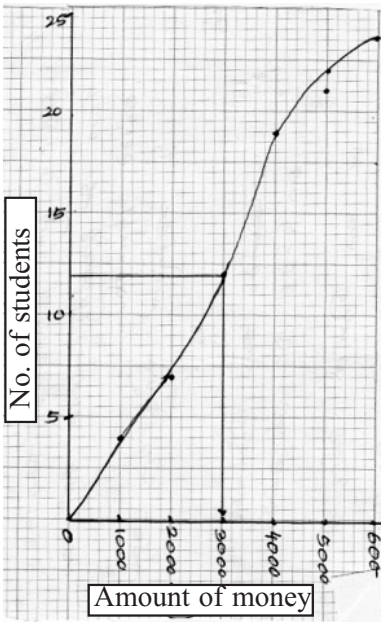
10

04. (i)

Cumulative frequency
4
7
12
19
22
24

— 01

(ii)



— 03

median $= \frac{1}{2} \times 24^{th}$

$= 12^{th}$ — 01

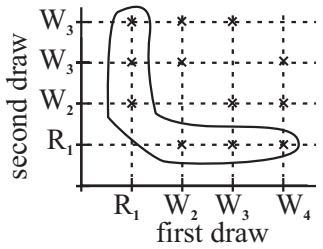
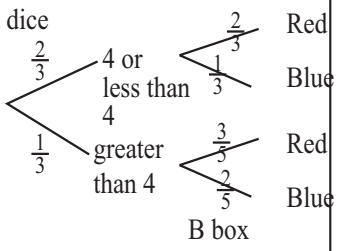
$=$ Rs. 3 000 — 01 — 06

(b) (i) angle in school van sector

$= 360^0 - (100^0 + 125^0 + 45^0)$

$= 360^0 - 270^o$

$= 90^0$ — 01

	no. of student who walk to school $= \frac{24}{90^0} \times 45^0$	01	
	$= 12$	01	
	(ii) by bus $= \frac{100^0}{360^0}$	01	04
	$= \frac{5}{18}$		**10**
05.	(a) (i) 	02	
	Circling correctly	01	
	Probability $\frac{6}{12}$ or $\frac{1}{2}$	01	
	(ii) Probability $= \frac{6}{16} \times 100$	01	05
	$= 37.5\%$		
	(b) (i) A box 		03
	(ii) getting a red pen = $\left(\frac{2}{3} \times \frac{2}{3}\right) + \left(\frac{1}{3} \times \frac{3}{5}\right)$	01	
	$\frac{4}{9} + \frac{1}{5}$		
	$\frac{20 + 9}{45}$		
	$\frac{29}{45}$	01	02
			10
	Paper - II		
01.	(a) (i) $y = -5$	01	
	(ii) Marking axes correctly	01	
	Marking points correctly	01	
	Drawing a smooth curve	01	04
	(b) (i) (2, -5)	01	
	(ii) $-0.2 < x < 4.2$	02	03
	(c) (i) $x = -0.2$ and	01	
	$x = 4.2$	01	
	(ii) $y = (x - 2)^2 - 4$	01	03
			10

02.

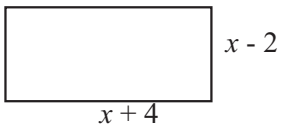
Class interval	x	f	fx
20-24	22	4	88
25-29	27	7	189
30-34	32	18	576
35-39	37	12	444
40-44	42	6	252
45-49	47	3	141
		$f = 50$	$fx = 1690$

01

(i) 30 - 34	01	
Correct mid values	01	
Correct fx values	01	
fx	01	
Mean $= \frac{fx}{f} = \frac{1690}{50}$	01	
$=$	01	
$=$ minutes	01	
No. of employes $= \frac{1440 \times 34}{60 \times 8}$	01	
$= 102$	01	
$= 102 > 100$	01	09
		10

03.	(i) Rs. 2 800	01	
	10 installment	01	02
	(ii) month units $= \frac{10}{2}(10 + 1)$	01	
	$= 55$	01	02
	(iii) Total interest $=$ Rs. 35×55		
	$=$ Rs. 1925	01	
	Total amount $=$ Rs. 28 000		
	$+$ Rs. 1 925		
	Rs. 29 925	01	
	Monthly installment $= \frac{\text{Rs. } 29\,925}{10}$		
	$= ₹.\ 2\,992.50$	01	03
	(iii) interest rate of shop B		
	$= \frac{42}{2\,800} \times 100 \times 12$	02	
	$= 18\%$	01	03
			10

04. (i)



length = $(x + 4)$ cm 01
breadth = $(x - 2)$ cm 01 02

(ii) Area = length x breadth
$(x + 4)(x - 2) = 41$ 01
$x^2 - 2x + 4x - 8 = 41$ 01
$x^2 + 2x - 8 = 41$
$x^2 + 2x - 8 - 41 = 0$
$x^2 + 2x - 49 = 0$ 01 03

(iii) $x^2 + 2x = 49$
$x^2 + 2x + 1 = 49 + 1$
$(x + 1)^2 = 50$
$x + 1 = \pm \sqrt{50}$ 01
$x + 1 = \pm 5\sqrt{2}$
$x = \pm 5\sqrt{2} - 1$

x can not be negative
$\therefore \quad x = 5\sqrt{2} - 1$ 01
length of rectangle = $x + 4$
$= 5\sqrt{2} - 1 + 4$ 01
$= 5 \times 1.41 + 3$ 01
$= 10.05$cm 01 05
10

05. (a) $\frac{1}{4x + 4} - \frac{1}{5x + 5}$

$\frac{1}{4(x + 1)} - \frac{1}{5(x + 1)}$ 02

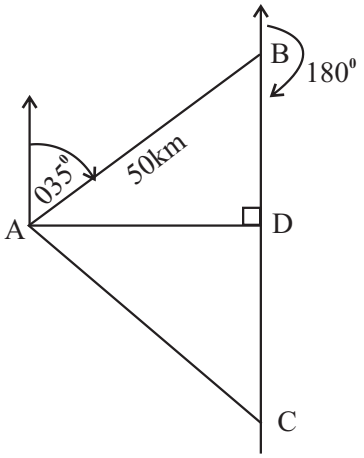
$\frac{5 - 4}{20(x + 1)}$

$\frac{1}{20(x + 1)}$ 01 03

(b) (i) kids shirt = a
kids trouser = b
$180a + 150b = 2940$ ——① 01
$100a + 150b = 2300$ ——② 01 02

(ii) $180a + 150b = 2940$ ——①
$100a + 150b = 2300$ ——②
① - ②
$80a = 640$ 01
$a = 8$ 01
Substituting to ①
$180 \times 8 + 150b = 2940$ 01
$1440 + 150b = 2940$
$150b = 2940 - 1440$
$150b = 1500$
$b = 10$ 01
no. of kids shirts = 8
no. of kids trousers = 10 01 05
10

06. (i)



Marking 035^0, 180^0, 50km 02

(ii) $\sin 35^o = \frac{AD}{50}$ 01

$0.5736 = \frac{AD}{50}$ 01

AD = 28.68 km 01 03

(iii) $\tan A\hat{C}D = \frac{28.68}{20}$ 01

$= 1.434$ 01

$A\hat{C}D = 55^o\ 07'$ 01 03

(iv) $360^o - 55^o\ 07'$ 01

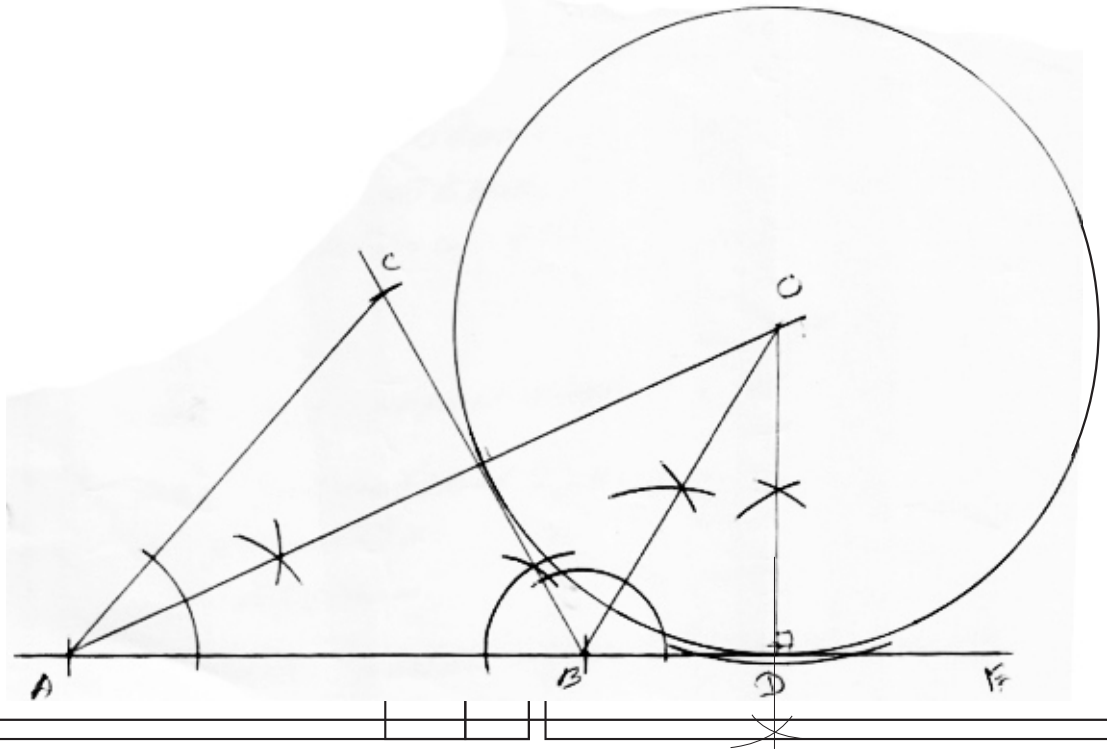
$= 304^o\ 53'$ 01 02
10

07. (a) (i) 4, 8, 12, ...
arithmetic progression 01 01

(ii) Tn = a + (n - 1)d
$48 = 4 + (n - 1)\ 4$ 01
$44 = (n - 1)\ 4$
$11 = n - 1$ 01
$11 + 1 = n$
$12 = n$ 01 03

	(ii) $S_n = \frac{n}{2}(a + l)$		
	$= \frac{12}{2}(4 + 48)$	01	
	$= 6 \times 52$	01	
	$= 312$	01	03
	(b) $a = 3$, $r = -2$		
	$T_n = ar^{n-1}$	01	
	$192 = 3 \times (-2)^{n-1}$		
	$64 = (-2)^{n-1}$	01	
	$(-2)^6 = (-2)^{n-1}$		
	$6 = n - 1$		
	$6 + 1 = n$	01	03
	$n = 7$		**10**
09.	(i) Constructing AB	01	
	Constructing $A\hat{B}C = 60^0$	01	
	Drawing ABC triangle	01	03
	(ii) Drawing BE	01	
	Constructing the bisector of $E\hat{B}C$	01	02
	(iii) Constructing the bisector of $B\hat{A}C$	01	
	Marking 'O'	01	
	Constructing OD	01	03
	(iv) Constructing the circle with radius OD		01
	(v) Because $D\hat{A}O = O\hat{A}C$		01

08.	(a) Volume of cuboid = 8 x 8 x 18	01	
	Volume of 9 cylinders = $r^2h \times 9$		
	$= \frac{22}{7} \times a^2 \times 7 \times 9$	01	
	$\frac{22}{7} \times a^2 \times 7 \times 9 = 8 \times 8 \times 18$	01	
	$a^2 = \frac{8 \times 8 \times 18}{22 \times 9}$	01	
	$a^2 = \frac{64}{11}$		
	$a = \sqrt{\frac{64}{11}}$	01	05
	$a = \frac{8}{\sqrt{11}}$		
	(b) $a = \frac{8}{\sqrt{11}}$		
	$= lg\ 8 - \frac{1}{2} lg\ 11$	01	
	$= 0.9031 - \frac{1}{2} \times 1.0414$	02	
	$= 0.9031 - 0.5207$	02	
	$= 0.3824$		
	$= only\ 0.3824$		
	a = antilog 0.3824		
	$a = 2.412$ cm	01	05
	$\therefore\ a = 2.41$ cm		**10**



10

10. (i) To be proved CEFD is a parallelogram

Proof :- $D\hat{B}F = A\hat{C}F$ (AB = AC) — 01

$D\hat{F}B = A\hat{C}F$ (AE // DF) — 01

$D\hat{B}F = D\hat{F}B$

BD = DF — 01

But BD = AD (D is the mid point)

DF = AD

CE = AD (given) — 01

DF = CE

Also DF // CE

CEFD is parallelogram — 01

(ii) To be proved :- 4BS = AB

Proof :- AC // DF, AD = BD } (data)

F is the mid point of BC — 01

Also DC // FS

S is the mid point of BD — 01

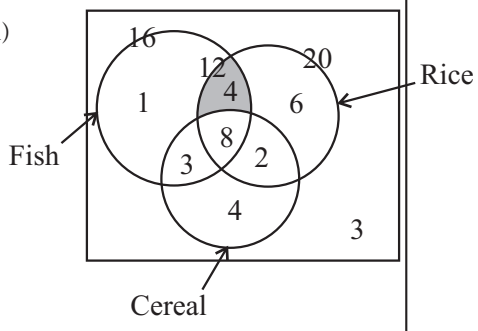
BS = DS — 01

2BS = BD

4BS = AB — 01

10

11. (i)



04

(ii) = 8 + 2 + 3 + 4 = 17 — 01

(iii) — 02

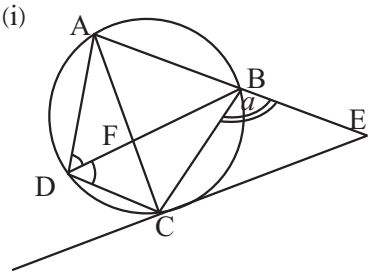
(iv) 17 + 1 + 4 + 6 + 3 = 31 — 02

(v) A - people who bought rice — 01

B - people who bought fish

10

12. (a) (i)



(ii) (a) $A\hat{D}C = a$ (the exterior angle of a cylic quadrilateral is equal to the interior opposite ∢) — 01

$B\hat{D}C = \frac{a}{2}$ (BD bisects $A\hat{D}C$) — 01

(b) $C\hat{A}B = \frac{a}{2}$ (angles in the same segment) — 01

CAB = $B\hat{C}E$ (angles in the alternate segment ∢)

$BCE = \frac{a}{2}$ — 01 — 04

(b) (i) In the ADF and BFC

$A\hat{F}D = B\hat{F}C$ (vertically opposite) — 01

$D\hat{A}F = F\hat{B}C$ (angles in same segment) — 01

$A\hat{D}F = F\hat{C}B$ (angles in same segment) — 01 — 03

ADF and BFC are equiangular

(ii) $\frac{CF}{DF} = \frac{BC}{AD}$ — 01

$\frac{CF}{4} = \frac{4}{5}$ — 01

$CF = \frac{16}{5}$

CF = 3.2cm — 01 — 03

10