PROVINCIAL DEPARTMENT OF EDUCATION NORTH WESTERN PROVINCE
THIRD TERM TEST - 2019
MATHEMATICS - I

Grade 10 **Two Hours**
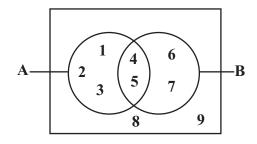
Name / Index No. :

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

PART - A

01. If **4.2 x 4.2 = 17.64** and **4.3 x 4.3 = 18.49**, find the value of $\sqrt{18}$, to the first approximation.
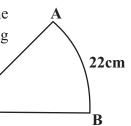
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02. If custom duty of **40%** is charged when an electric equipment worth **Rs. 15 000** is imported, find the amount has to be paid as duty.

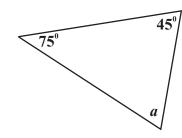03. According to the venn diagram, write the set of $\mathbf{A^{/}}$ $\mathbf{B}$.

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04. Write $\boldsymbol{lg}\,\mathbf{7 = 0.8451}$ in index form.
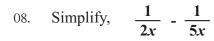
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05. A sector **OAB** which was cut from a circle with centre **O** is given in the diagram. Find the circumference of the circle which it was cutting down.

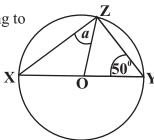06. Find the value of **'*a*'**.

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07. The mean of the deviation of a frequency distribution is **-3** and its assumed mean is **85**. Find the actual mean of the frequency distribution.

08. Simplify, $\dfrac{1}{2x} - \dfrac{1}{5x}$

09. In an arithmatic progression the first term is **3** and the common difference is **2**. If its last term is **31**, find the number of terms in the progression.

10. Write 2 positive integers which satisfy the inequality of $2x - 4 \leq 1$.

11. **X, Y** and **Z** are the three points on the circle with centre **O**. According to the given data, find the value of '**a**'.
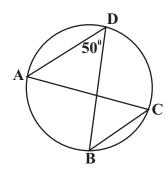

12. Put '✓' mark in front of each correct statement and '✗' mark in front of each incorrect statement.
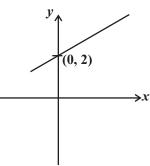
- Diagonals of a parallelogram are equal in length.
- In any parallelogram, opposite angles are supplementary.
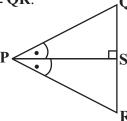- In a rhombus all the sides are equal in length.

☐
☐
☐

13. Find the value of $A\hat{C}B$.

14. If the gradient of the given straight line is **3**, write its equation in the form of $y = mx + c$.

15. Factorize. $a^2 - 2a - 15$

16. In the triangle **PQR**, the bisector of $Q\hat{P}R$ is **PS**. If **PS** $\perp$ **QR**. Write the case of congruency of the triangles **PQS** and **PRS**.
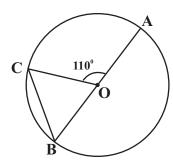
17. Without solving the following simultaneous equations, find the value of $x + y$.

$$3x - y = 2$$
$$x + 5y = 10$$

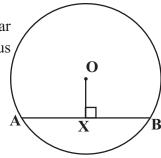18. The centre of the given circle is **O**. Find the value of $B\hat{C}O$.

19. The volume of a triangular prism is **450cm³**. If the area of the triangular face of it is **30cm²**, find the length of the prism.
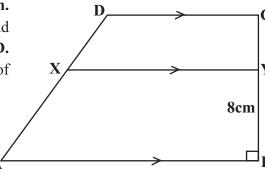
20. Find the L.C.M. of following algebraic terms,

$2x$, $3x^2$, xy

21. **AB** is a chord of the given circle. **OX** is the perpendicular drawn to **AB**. If **AB = 16cm** and **OX = 6cm**, find the radius of the circle.

22. The speed of a vehicle is **54 kmh⁻¹**. Find the speed of it in **ms⁻¹**.

23. In a parcel there are orange flavored toffees and strawberry flavored toffees. Out of them **7** are orange flavored. When taking a toffee from the parcel randomly, the probability of obtaining an orange flavored toffee is $\frac{1}{3}$. Find the number of strawberry flavored toffees in the parcel.

24. Two men complete a certain task within a day. Three women complete the same task within a day. Find the number of days needed for **4** men to complete the task which completed by **5** women during **6** days.

25. In the trapezium shaped sheet **ABCD**, **BY = 8cm.** There is a hole such that **8cm** away from **AB** and equaidistance from the edges of **AB** and **AD.** Using the knoweldge of loci, find the location of the hole and name it as **P**.
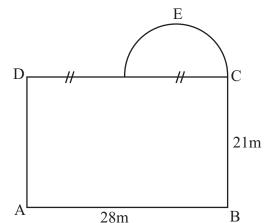
PART - B

(01) (a) Simplify.

(i) $\dfrac{3}{5} + \dfrac{1}{5} \times \dfrac{2}{3}$ (ii) $2\dfrac{1}{2}$ of $\dfrac{3}{5}$ $\dfrac{3}{8}$

(b) Amaya ate $\dfrac{3}{8}$ of chocolate balls from a parcel received on her birthday. She gave $\dfrac{2}{5}$ of the remaining to his grand father and rest for her mother.

(i) Find the number of chocolate balls received by her grand father, as a fraction of total number of chocolate balls.

(ii) If the number of chocolate balls received by her mother is 6, find the total number of chocolate balls in the parcel at the beginning.
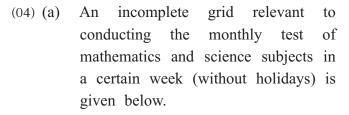
(02) (a) A semicircular pond is situated outside of the rectangular cropland ABCD as shown in the figure.
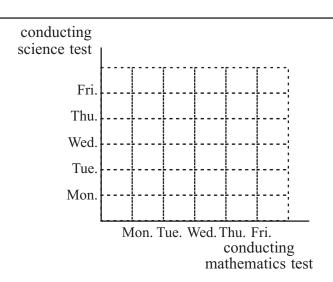
(i) Find the radius of the pond.

(ii) Find the perimeter of the cropland including the pond.

(iii) Find the area of the pond.

(iv) If an extent of land is newly added to cultivate 'Gotukola', such that the cropland is being square shaped and the pond is included to the cropland. Draw the extent of land newly added in the above diagram.

(v) Find the area of the extent of land which was cultivated 'Gotukola'.

(03) To strat a batik saree manufacturing business, Mr. Thilakawardhana takes a loan of Rs. 500 000 on annual simple interest rate of 12% promissing to settle the loan in one year.

(i) Find the interest he has to paid at the end of the year.

(ii) The production cost of a saree is Rs. 2400. Find the price should be marked to get a 50% profit from a saree.

(iii) When selling a saree, if Rs. 180 discount is given. Find the discount percentage.

(iv) Find the profit obtained by him when selling a saree.
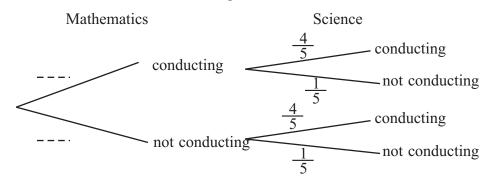
(v) In the first year, if he produced 1000 sarees and sold them, find the remaining amount after paying the loan.

(04) (a) An incomplete grid relevant to conducting the monthly test of mathematics and science subjects in a certain week (without holidays) is given below.

(i) Complete the grid relevant to the sample space.
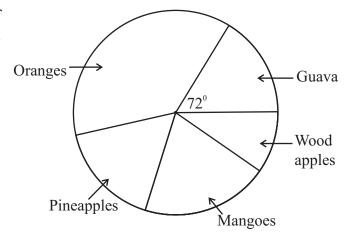
(ii) Find the probability of conducting both tests in a same day.

(iii) Represent the event of conducting mathematics test on Wednesday and Science test on a day after it, in the grid and find the probability of it.

(b) The tree diagram relevant to conducting the mathematics test on Wednesday and Science test on another day in the week is given below.

(i) Fill in the blanks in the thre diagram.

(ii) Find the probability relevant to conducting the mathematics test on Wednesday and Science test on another day.

(05) The information about the number of fruits in a local fruits outlet on a certain day is given in the following pie chart.

(i) If $\frac{1}{3}$ of the total fruits are oranges, find the angle of the sector of it.

(ii) On that day there were 288 guava, find the total number of fruits in the fruit outlet.

(iii) If the number of wood apples is 192 and the number of oranges is equal to the number of pineapples. Find the number of pineapples in the fruit outlet on that day.

(iv) On that day the number of sold fruits is 360. Out of them 90 were oranges. Find the angle of the sector for mangoes, in the newly drawn pie chart to represent the remaining number of fruits.

PROVINCIAL DEPARTMENT OF EDUCATION NORTH WESTERN PROVINCE
THIRD TERM TEST - 2019
Grade 10   # MATHEMATICS - II   **Three Hours**

Name / Index No. :

- **Answer ten questions selecting five questions from part A and five questions from part B.**
- **Each questions carries 10 marks.**
- **The volume of a right circular cylinder with base radius *r* and height *h* is r^2h.**

Part - A

(01) The assessed annual value of a certain business institution which lies within the limits of a certain urban council is Rs. 350 000. The owner of the institution rents out it for a monthly rent of Rs. 8000 each and takes the annual rent at once. After paying the rates for the 1st quarter from it, Rs. 92 500 was remained.

   (i)   Find the annual rates percentage charge by the urban council

   (ii)   He buy meterials for reparing the house. He spent 60% of the above remained amount for the materials and VAT. If the VAT percentage is 15%.

      (a)   Find the amount spent for reparing the house.

      (b)   Find the value of the bill.

(02) An incomplete values of table prepared to draw the graph of the function $y = 5 - x^2$ is given below.

x	-3	-2	-1	0	1	2	3
y	-4	1	4	......	4	1	-4
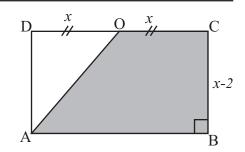
   (a)   Finding the value of y when $x = 0$, draw the graph of the above function using the scale of 10 small divisions as one unit along both x axis and y axis.

   (b)   Using the graph,

      (i)   Write the co-ordinates of the vertex.

      (ii)   Write the range of values of x for which the function increases positively.

      (iii) When the above graph is moving two units down the y axis, write the equation of the graph obtained.

(03) (a) Solve.
$$\frac{2}{x-5} - \frac{3}{x} = 0$$
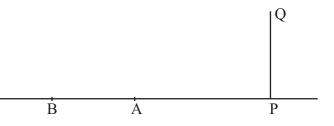
(b) A certain amount of vessels with the volume of 50*ml* and 75*ml* are completely filled using 6 *l* of water. The number of vessels with 50*ml* volume is 70 greater than the number of vessels with 75*ml* volume. By taking the number of vessels with 75*ml* volume as *x* and the number of vessels with 50*ml* volume as *y*, build up two simultaneous equations and by solving them find the number of vessels with 75*ml* volume and 50*ml* volume separately.

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(04) The following table has been prepared using the number of beads collected by 50 students in a game of collecting beads held in a certain pre-school.

No. of beads	0 - 8	9 - 17	18 - 26	27 - 35	36 - 44	45 - 53	54 - 62
No. of students	5	7	10	13	12	2	1

(i) How much can be the minimum number of beads collected by the winning students.

(ii) Find the modal class of this distribution.

(iii) Using a suitable assumed mean or any other method, find the mean number of beads collected by a student to the nearest whole number.

(iv) Write the number of students who collected less number of beads than the mean number of beads as a percentage of total number of students.

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(05) In the rectangle ABCD, the mid point of DC is O, DO = *x* and BC = *x* - 2. If the area of the trapezium ABCD is 180cm², build up a quadratic equation for the area of the trapezium and by solving it find the area of the triangle AOD.

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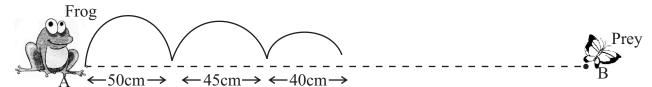
(06) PQ is a vertical post erected on a level horozontal ground. Supun who standing on point A in the level ground observes a bird on the top of the post with the angle of elevation of 55⁰. From that place Supun moves to the point B which is 12m away from point A and again observes the bird on the top of the post with the angle of elevation 25⁰.
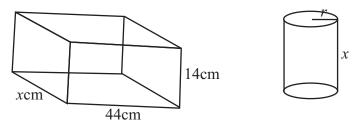
(i) Copy the given rough diagram in your answer script and include the above information in it. (neglet supun's height)

(ii) Taking the scale of 1cm ⟶ 2m, Draw a scale diagram and find the height of the vertical post PQ.

(iii) Find the distance from the foot of the post to the point B.

(iv) Supun moves 8m towards the post from B and reaches to the point C. Represent the angle of depression of the point C from the point Q in the scale diagram and show that it is greater than 40⁰.

(07) The following figure represents how a frog in point A reaches to a prey in point B along a linear path.

The frog reaches to the prey by leaping 50cm in the first leap, 45cm in the second leap, 40cm in the third leap.... etc.,
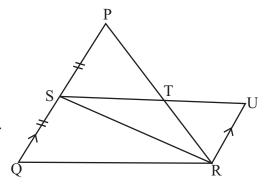
(i) Show that the distance leaped by the frog in each leaps are lying in an arithmetic progression.

(ii) Using the formula, find the distance leaped by the frog in 7th leap.

(iii) As above, if the frog reaches in 9 leaps to the prey, find the distance between A and B.

(iv) After taking the prey, if the frog again reaches to the point A along the same route with 10 equal leaps. Find the distance of frog's one leap.

(08) (a) A right circular solid cylinder of base radius r and height x is made out of the metal obtained by melting a solid metal cuboid with length, breadth and height of 44cm, x cm and 14cm respectively and without any westage of metal. Find the radius of the cylinder.
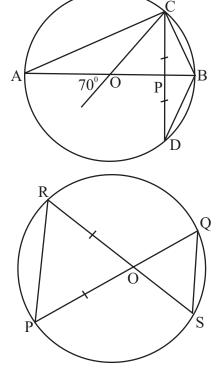
(b) Find the value using the logarithmic tables.

$$\frac{784.3}{62.3 \times 8.4}$$

(09) Using only a straight edge with a cm/mm scale and a pair of compasses,

(i) Construct a circle of radius 5cm and name its centre as O.

(ii) Construct the chord AB of 6cm and construct a perpendicular to AB from O.

(iii) Construct the chord XY such that 7cm away from AB and parallel to AB.

(iv) Construct the triangle ABC such that $B\hat{A}C = 60^0$ and the point C lies on XY. Then measure and write the length of AC.
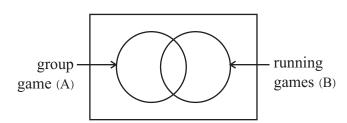
(10) In the given diagram, SQRU is a parallelogram. PQR is an isosceles triangle such that PR = RQ. The mid point of PQ is S.

(i) Show that T, is the mid point of PR,

(ii) Show that PSRU is a parallelogram.

(iii) Find the value of $S\hat{R}U$.

(iv) Write the special name that can be identified PSRU.

(11) (a) AB is a diameter of the circle with centre O. The chord CD intersects AB at P as shown in the figure. According to the given data. Find the value of following angles.

(i) $B\hat{O}C$

(ii) $B\hat{D}C$

(iii) $A\hat{C}B$

(iv) $A\hat{B}D$

(v) $O\hat{C}P$

(b) The chords PQ and RS intersect at X. If PO = RO show that PQ = RS.

(12) In a certain sports training pool there are 40 players. Out of then 23 are trained for team games and 16 are trained for running games 14 players are trained for other games except the above two games.

(i) Copy the given venn diagram on to your answer sheet and include the above information.

(ii) Find the number of players who trained both group and running games.

(iii) Find $n(A \cap B')$.

(iv) Due to an injury, 3 players who trained only running games left the pool. Draw a venn diagram to represent the remaining players and include the information on it.

විෂයය Subject		විභාග අංකය Index No.	

ගණිතය II

Answer Sheet

Paper I - A

01.	4.2		02
02.	Rs. 6000		02
	$\dfrac{40}{100}$ x 15 000	01	
03.	{6, 7}		02
04.	$10^{0.8451} = 7$		02
05.	176cm		02
	22 x 8	01	
06.	60^0		02
	$a + 75^0 + 45^0 = 180^0$	01	
07.	82		02
	85 - 3	01	
08.	$\dfrac{3}{10x}$		02
	$\dfrac{5}{10x} - \dfrac{2}{10x}$	01	
09.	$31 = 3 + (n - 1) \times 2$	01	
	n = 15	01	02
10.	1, 2		02
	$x \le 2\dfrac{1}{2}$	01	
11.	$a = 40^0$		02
	$x\hat{z}y = 90^0$ or $o\hat{z}y = 50^0$	01	
12.	(i) ✗ for 3 correct answers		02
	(ii) ✗ for 2 correct answers	01	
	(iii) ✓		
13.	50^0		02
14.	$y = 3x + 2$		02
15.	(a - 5) (a + 3)	1+1	02
16.	A. A. S.		02
17.	$x + y = 3$		02
	$4x + 4y = 12$	01	
18.	55^0		02
	$\dfrac{110}{2}$ or $O\hat{B}C = 55^0$	01	
19.	15cm		02
	450 30	01	
20.	$6x^2y$		02

21.	10cm		02
	$6^2 + 8^2 = OB^2$ / x B = 8cm	01	
22.	15ms^{-1}		02
	$54 \times \dfrac{5}{18}$ or $\dfrac{54 \times 1000}{60 \times 60}$	01	
23.	14		02
	21	01	
24.	5 days		02
	$\dfrac{2 \times 5 \times 6}{4 \times 3}$	01	
25.			02
			50

Paper I - B

01.	(a)	(i)	$\dfrac{3}{5}$ $\dfrac{2}{15}$	01	
			$\dfrac{11}{15}$	01	02
		(ii)	$\dfrac{5}{2}$ of $\dfrac{3}{5}$ $\dfrac{3}{8}$	01	
			$\dfrac{3}{2} \times \dfrac{8}{3}$	01	
			4	01	03
	(b)	(i)	$\left(1 - \dfrac{3}{8}\right)$ of $\dfrac{2}{5}$	01	
			$\dfrac{5}{8}$ of $\dfrac{2}{5}$ for $\dfrac{5}{8}$	01	
			$\dfrac{1}{4}$ for $\dfrac{1}{4}$	01	02
		(ii)	$1 - \left(\dfrac{3}{8} + \dfrac{1}{4}\right)$		
			$\dfrac{3}{8}$	01	
			$\dfrac{6 \times 8}{3}$	01	
			16	01	03
					10

Answer Sheet

02.	(i) 7 m		01

02.

(i) 7 m — 01

(ii) $\dfrac{1}{2}$ x 2 x $\dfrac{22}{7}$ x 7 — 01

22 m — 01

28 + 21 + 22 + 14 + 21 — 01

106 m — 01   **04**

(iii) $\dfrac{1}{2}$ x $\dfrac{22}{7}$ x 7 x 7 — 01

77 m² — 01   **02**

(iv)

21m — 01

28m

(vi) 28 x 7 = 196m² — 01

196 - 77 = 119m² — 01   **02**

10

03.

(i) 500 000 x $\dfrac{12}{100}$ — 01

Rs. 60 000 — 01   **02**

(ii) 2400 x $\dfrac{150}{100}$ — 01

Rs. 3600 — 01   **02**

(iii) $\dfrac{180}{3600}$ x 100 — 01

5% — 01   **02**

(iv) 3600 - (2400 + 180) — 01

Rs. 1020 — 01   **02**

(v) Rs. 1 020 000 — 01

Rs. 460 000 — 01   **02**

10

04.

(a) (i) for correct grid — **02**

(ii) for $\dfrac{5}{25}$ or $\dfrac{1}{5}$ — **02**

(iii) for event — 01

$\dfrac{2}{25}$ — 01   **02**

(b) (i) $\dfrac{1}{5}$ ⟍ conducting

$\dfrac{4}{5}$ ⟍ not conducting — 1+1   **02**

(ii) $\dfrac{4}{25}$ — **02**

10

05.

(i) 360⁰ x $\dfrac{1}{3}$ — 01

120⁰ — 01   **02**

(ii) $\dfrac{288}{72}$ x 360 — 01

1440 — 01   **02**

(iii) 4⁰ — 01

48⁰ — 01

60⁰ — 01

240⁰ — 01   **04**

or

any other method

(iv) 150 — 01

50⁰ — 01   **02**

10

Paper II - A

01.

(i) 8000 x 12 — 01

Rs. 96 000 — 01

96 000 - 92 500 — 01

Rs. 3500 — 01

3500 x 4

Rs. 14 000 — 01

$\dfrac{14\ 000\ x\ 100}{350\ 000}$ — 01

4% — 01   **06**

(ii) (a) $\dfrac{60}{100}$ x 92 500 — 01

Rs. 55 500 — 01   **02**

(b) 55 500 x $\dfrac{85}{100}$ — 01

Rs. 47 175 — 01   **02**

10

02.

(a) 5 — 01

correct co-ordinate plane — 01

for correct points — 01

smooth curve — 01   **04**

(b) (i) (0, 5) — **02**

(ii) -2.2 < x < 0 — **02**

(iii) y = 3 - x² — **02**

10

Answer Sheet

Paper II - A

03. (a)	$\dfrac{2x - 3x + 15}{x\,(x - 5)} = 0$ or	02	
	for $2x - 3\,(x - 5)$		
	$-x + 15 = 0$	01	
	$x = 15$	01	04
(b)	$y - x = 70$ } for two	01	
	$75x + 50y = 6000$ } equations	01	
	for equaling the coefficient and	01	
	$y = 90$	01	
	substitution	01	
	$x = 20$	01	06
			10

04. (i)	54	01	
(ii)	27 - 35	01	
(iii)	Mid values		
	4, 13, 22, 31, 40, 49, 58	01	
	fx or fd colum	02	
	$fx = 1370$ or $fd = 180$	01	
	27.4	01	
	27	01	06
(iv)	$\dfrac{22}{50}$ x 100	01	
	44%	01	02
			10

05.	$\dfrac{(2x + x)}{2}\,(x - 2) = 180$	01	
	$\dfrac{3x}{2}\,(x - 2) = 180$	01	
	$3x^2 - 6x = 360$	01	
	$x^2 - 2x - 120 = 0$	01	
	$(x - 12)\,(x + 10) = 0$	02	
	$x = 12$ or $x = -10$	01	
	$12 - 2 = 10$	01	
	$\dfrac{1}{2}$ x 10 x 12	01	
	60cm²	01	10
			10

06. (i)	representing 55^0, 25^0, 12m	02	
(ii)	correct angles	01	
	6cm	01	
	scale diagram	01	
	4.2cm	01	
	4.2 x 2 = 8.4m	01	05

(iii)	2.9 x 2 = 5.8m		01
(iv)	for marking the angle of depression	01	
	$41^0 > 40$	01	02
			10

Paper II - B

07. (i)	difference between the successive terms is equal		01
(ii)	$Tn = a + (n - 1)d$	01	
	$= 50 + (7 - 1)$ x 5	01	
	= 20cm	01	03
(iii)	$Sn = \dfrac{n}{2}\,\{2a + (n-1)d\}$	01	
	$= \dfrac{9}{2}\,\{2 \times 50 + (9-1) \times -5\}$	01	
	$= \dfrac{9}{2}\,\{100 - 40\}$	01	
	$= \dfrac{9}{2}$ x 60	01	
	= 270cm	01	04
(iv)	270 10	01	
	27cm	01	02
			10

08. (a)	$r^2h = 44 \times 14 \times x$		
	$\dfrac{22}{7}$ x r^2 x $x = 44$ x 14 x x	02	
	$r^2 = \dfrac{44 \times 14 \times x \times 7}{22 \times x}$	01	
	$r^2 = 196$ or 14^2	01	
	r = 14 cm	01	05
(b)	$lg\ 7.843 \times 10^2 - (lg\ 6.23 \times 10^1 + lg\ 8.4 \times 10^0)$	01	
	2.8945 - (1.7945 + 0.9243)	01	
	2.8945 - 2.7188	01	
	Antily 0.1757	01	
	1.498	01	05
			10

09. (i)	circle, centere O	1+1	02
(ii)	for chord	01	
	for perpendicular	02	03
(iii)	for construction		02
(iv)	constructing angle	01	
	triangle	01	
	8cm	01	03
			10

Answer Sheet

10.	(i) in the SPT and RUT $\quad$ $S\hat{P}T = T\hat{R}U$ (Alternative angles) $\quad$ $P\hat{S}T = T\hat{U}R$ (Alternative angles) $\}$ for two $\quad$ $P\hat{T}S = R\hat{T}U$ (Vertically opposite angles) $\}$ $\quad\quad$ PS = UR (data) $\quad\quad$ SPT $\quad$ RUT $\quad$ (A. A. S.) $\quad$ Corresponding elements of congruent triangles $\quad\quad$ PT = TR	01 01 01 01 04
	(ii) In the quadrilateral PSRU $\quad$ $\left.\begin{array}{l} PT = TR \\ ST = TU \end{array}\right\}$ Corresponding elements of congruent triangles $\quad\quad$ PSRU is a parallelogram	01 01 02
	(iii) $P\hat{S}R = 90^0$ (Isosceles angles) $\quad$ $P\hat{S}R + S\hat{R}U = 180^0$ (Allied angles) $\quad\quad$ $S\hat{R}U = 90^0$	01 01 01 03
	(iv) Rectangle	01
		10
11.	(a) (i) 70^0	01
	$\quad$ (ii) 35^0	01
	$\quad$ (iii) 90^0	01
	$\quad$ (iv) 55^0	01
	$\quad$ (v) 20^0	01
	(b) $O\hat{R}P = O\hat{P}R$ (Isosceles triangles) $\quad$ $O\hat{R}P = O\hat{Q}S$ (Angles in the same segment) $\quad$ $O\hat{P}S = O\hat{S}R$ (Angles in the same segment) $\quad\quad$ $O\hat{Q}S = O\hat{S}Q$ $\quad\quad$ OQ = OS $\quad\quad$ PO = RO (Data) $\quad\quad$ PO + OQ = RO + OS $\quad\quad\quad$ PQ = RS	01 01 01 01 01 05
		10
12.	(i)	01 01 01 01 04
	(ii) 13	01
	(iii) 10	02
	(iv)	01 01 01 03
		10