PROVINCIAL DEPARTMENT OF EDUCATION - NORTH WESTERN PROVINCE

THIRD TERM TEST - 2022

MATHEMATICS - I

Grade 11 **02 Hours**

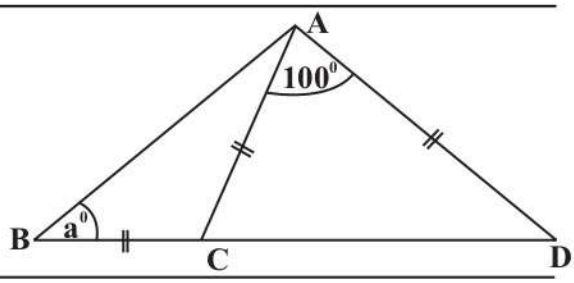
Name / Index No. : *

Answer all questions on the paper itself.
2 Marks for each questions of part A and 10 marks for each questions of Part B

Part A

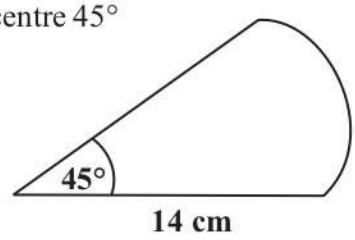
01. The monthly water bill without VAT of a certain household is Rs. 1600. If the VAT charges are 12%, what is the total value of the bill?

02. Find the value of a°, according to the data given in the figure.

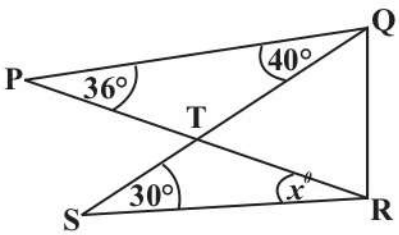


03. Factorize $2x^2 + 3x + 1$

04. Calculate the perimeter of the given sector of a circle with angle at the centre 45° and radius 14 cm.

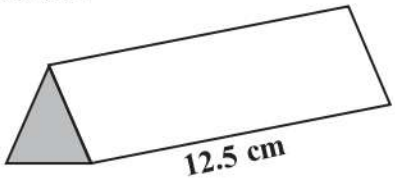


05. Based on the information given in the figure, find the value of x^o.

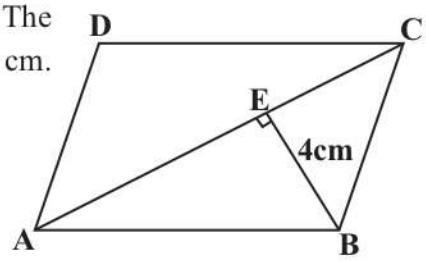


06. Simplify $8x^3y^2 \div 4xy^2$

07. The volume of the shape of a prism with a triangular cross section is 250 cm^3. Calculate the area of it's cross section.



08. In the given figure, the area of the parallelogram ABCD is 48 cm^2. The perpendicular height drawn from the point B to the diagonal AC is 4 cm. Calculate the length of the diagonal AC.



09. Find the Least Common Multiple of the following three algebraic terms.

$2xy^2$, $4x^2y$, $8x$

10. Find the inter-quatile range of the following set of data.

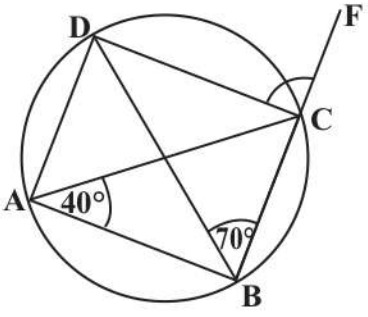
3 4 4 7 7 7 9 11 11 11 12 13 14 16 20

11. The total surface area of a right circular cylinder of the radius 7 cm is 1188 cm^2. The area of the two circular shapes is 308 cm^2. An incomplete step of finding the height of the cylinder is given below. Write the relevant values of x and y of the given step.

$$2 \times \frac{22}{7} \times x \times h = y$$

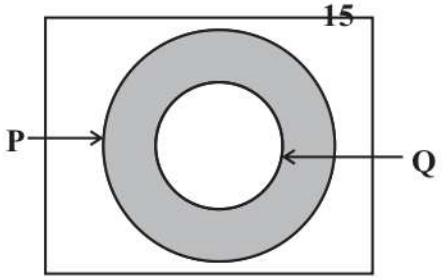
12. A discount of 8% is offered when a shirt of marked price Rs. 2 800 is purchased. Find the selling price of the shirt.

13. According to the given data, find the magnitude of $\hat{DCF}$.

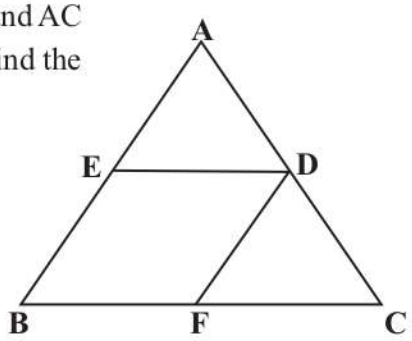


14. Solve. $x(2x+3)=0$

15. In the given Venn diagram, n(Q) = 7 and n(P') = 3. Write the number of elements represented by the shaded region.



16. In the given figure, E, F and D are the midpoint of the side AB, BC and AC respectively of the triangle ABC. If AB = 12 cm and BC = 16 cm, find the perimeter of the quadrilateral BFDE.



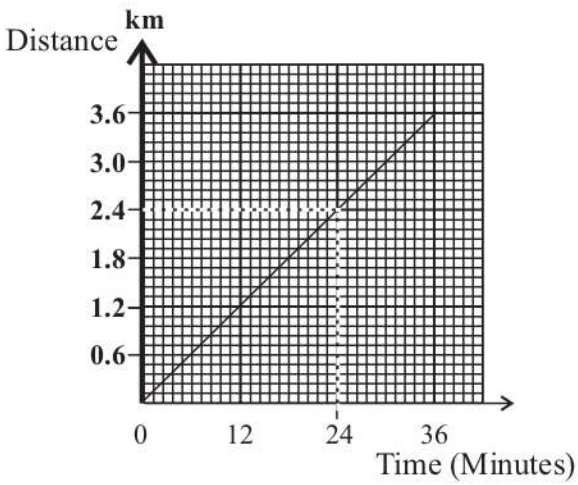
17. Select the correct statement from the following statements and insert the "✓" sign in the bracket, infront of the each correct statements.

★ The order of a matrix is the product of the number of rows & the number of columns. ( )

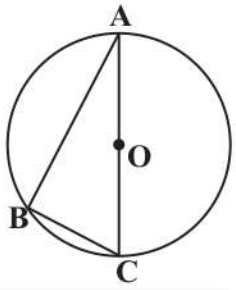
★ To multiply a matrix by a matrix, the number of columns of the first matrix should be equal to the number of rows of the second matrix. ( )

★ $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ is a identity matrix ( )

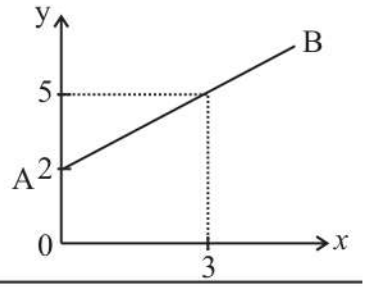
18. A distance - time graph of the motion of a man who travels from home to the city on foot is given below. How long did he take to travel 30 km.



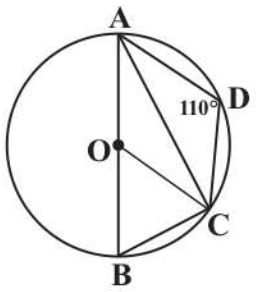
19. AC is a diameter of a circle with the centre O. The length of the chords AB and BC are 8 cm and 6 cm respectively. Find the length of the radius.



20. Find the gradient and the intercept of the straight line AB, in the figure.



21. Based on the information given in the figure, find the value of $A\hat{C}O$.



22. A certain task can be completed in 3 days by 4 men. It is expected to complete another task which is twice the size of the initial task by 6 men. How many days will require to complete the task.

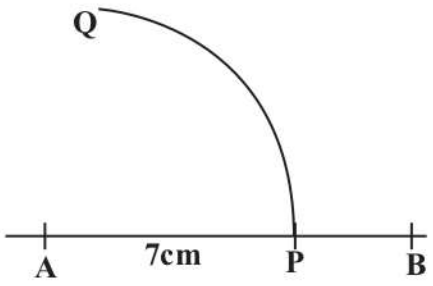
23. A and B are two mutually exclusive events. If $\mathbf{P(A)} = \frac{1}{6}$ and $\mathbf{P(B)} = \frac{7}{12}$

(i) Find $\mathbf{P(A \cap B)}$

(ii) Find $\mathbf{P(A \cup B)}$

24. Indicate as a power of 2, the 12th term of the geometric progression with the first term 8 and the forth term 64.

25 AB is a straight line segment of 9 cm. The locus of a point 7 cm away from the point A is PQ. Draw a sketch of the construction lines that are necessary to find the point T on the arc PQ which is at an equal distance from the points A and B.



Part B

(01) Mrs. Nandani wished to give $\frac{2}{5}$ of her land to her daughter and $\frac{5}{9}$ of the remaining portion of the land to her son.

(i) What portion of the total extent of land did her son receive ?

(ii) After giving the land to her son and daughter the remaining portion of the land is 2 hectares. Find in hectares the extent of the total land that Mrs. Nalani belongs.

(iii) Without considering the above manner, If the whole land is divided equally among 03 of them, find the difference between the extent of land that the daughter received and the extent of land that the daughter expect to receive, in hectares.

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(02) The annual assessed value of Mr. Dananjaya's building is Rs. 70 000. The municipal council charges annual rate of 6% on this property.

(a) (i) Find how much has to be paid as rates for the year.

(ii) Find how much has to be paid as rates for a quarter.

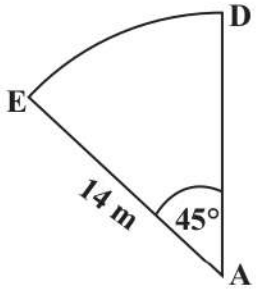
(b) Mr. Dananjaya pays income tax for a year, based on the table, given below.

Annual Income	Tax Percentage
Initial - **500 000**	Tax free
Next - **500 000**	**4 %**
Next - **500 000**	**8 %**

(i) Find the income tax that Mr. Dananjaya has to pay for his income of second Rs. 500 000

(ii) If M. Dananjaya has paid Rs. 32 000 as the total income tax, Calculate his total annual income.

(03) The figure denotes an extent of land of the shape of a sector of a circle, of radius 14 m and angle at the centre 45°. This land is used to grow "Gotukola".



(i) Calculate the area of the extent of land that is used to grow "Gotukola".

(ii) An extent of rectangular shaped land has to be attached to the above sector of the circle to grow vegetables according to the following requirements.

The area of the rectangular extent of land is four times the area of the sector of the circle.

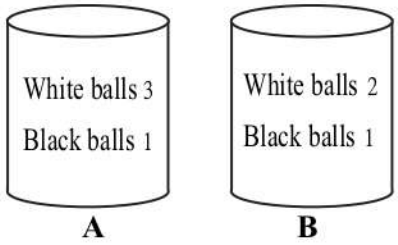
One side of the rectangle as AD.

Draw, with measurements, a sketch of the rectangular extent of land to be constructed in the above diagram.

(iii) Calculate the arc length of DE.

(iv) Find the perimeter of the extent of land after attaching the new extent of the land.

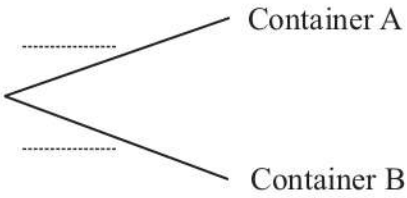
(04) (a) As given in the figure, container A and B are kept on Sarath's table. As mention in the diagram each container having balls which are identical in all other aspects.



Sarath randomly selects one container out of the two containers A and B, and then he takes one ball randomly from it.

(i) An incomplete tree diagram to represent the selecting a container is shown in the following diagram. Write down the corresponding probabilities on it.

Selecting a container Drawing a ball

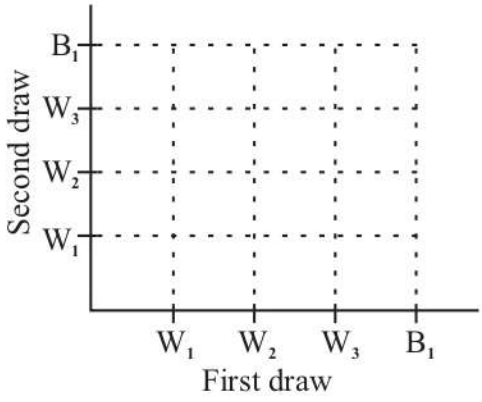


(ii) Extend the above tree diagram to include the probabilities of drawing a ball and write down the corresponding probabilities on the branches.

(iii) What is the probability of drawing a white ball.

(b) (i) Then Sarath rearrange the two containers as in the initial position. After that Nimali draws a ball randomly from the contain A and place in B. Then he draws another ball from the container A.

Represent the relevant sample space in the grid shown below.



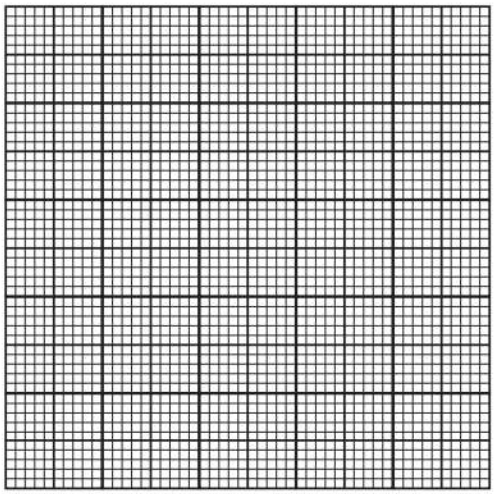
(ii) In the grid, encircle the event of selecting two balls with two different colours and find its probability.

(05) The following table shows the attendance of students in grade 11 class during a certain month.

0-5 in the table indicates the interval that consists of the value greater than or equal 0 and less than 5.

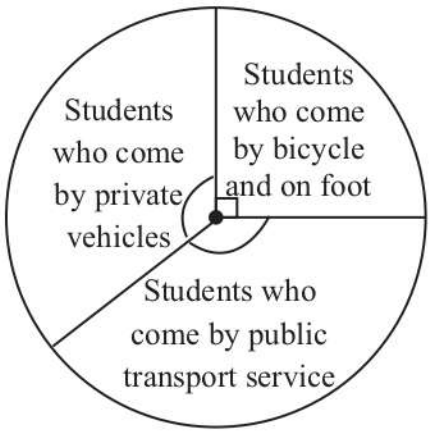
Attendance of the school	Number of students	Cumulative frequency
0 - 5	**2**	**2**
5 - 10	**3**	**5**
10 - 15	**5**	**10**
15 - 20	**20**	**-**
20 - 25	**-**	**40**

(a) (i) Fill in the blanks in the table. Using the information given in the table, draw the cumulative frequency curve on the given co-ordinate plane.



(ii) Based on the cumulative frequency curve, find the inter - quatile range.

(b) The given pie-chart shows information about the mode of transport of the above 40 students.



(i) According to the above pie-chart, Write the number of students who come by bicycle and on foot as the fraction of the total number of students.

(ii) What is the magnitude of the angle of the sector which represent the number of students who come by public transport service, if the number of students who come by public transport is 15.

PROVINCIAL DEPARTMENT OF EDUCATION - NORTH WESTERN PROVINCE

THIRD TERM TEST - 2022

MATHEMATICS - II

Grade 11

Time : 3 Hours
Additional reading time : 10 minutes

Name / Index No. : *

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 right circular cone of the base radius r and height h is $\frac{1}{3}\pi r^2 h$**

Part A

(01) An incomplete table of values prepared to draw the function in the form $y = (x - a)^2 - b$ is given below.

x	-2	-1	0	1	2	3	4
y	7	2	-1	-2	.....	2	7

(a) (i) By considering the symmetry of the quadratic function, obtain the value of y when $x = 2$

(ii) Using the scale of 10 small divisions as one unit along both x axis and y axis, draw the graph of the above function on a graph paper.

(b) Using the graph,

(i) Write the equation of the axis of symmetry.

(ii) Write the value of a and b of the quadratic function of the form $y = (x - a)^2 + b$

(iii) Find the roots of the equation when y = 0 and using the positive root, find the approximate value of $\sqrt{2}$ to the first decimal place.

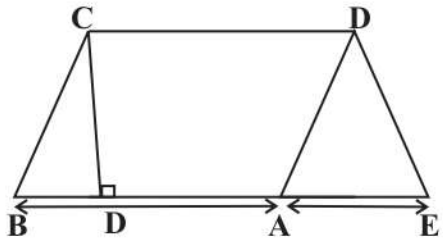
(02) (a) Simplify $\frac{4}{x^2 + 5x + 6} - \frac{1}{x + 2}$

(b) The deference of the amount of fuel bought by Kamal and Sanduni is 8 liters. The total amount spend by both of them to by fuel is Rs. 7 200. The price of 1 liter of fuel is Rs. 450. Taking the amount of fuel bought by Kamal as Rs. x and the amount of fuel bought by Sanduni is Rs. y, Construct two simultaneous equations containing x and y. Solve the two simultaneous equations and find the amount of fuel bought by Kamal and amount of fuel bought by Sanduni separately.

(03) (a) A person takes a loan of Rs. 275 000, promising to pay the interest at an annual simple interest rate of 12% from a certain commercial bank. How much does he have to pay as the interest to settle the loan in 2 years.

(b) Then he invested Rs. 175 000 out of the above loan to buy shares in a company at the market price of Rs. 25 per share. The company pays annual dividends of Rs. 12.50 per share. The remaining amount of the loan is deposited in an account paying 15% annual interest compounded yearly as the fixed deposit. Show that the sum of the annual dividends income he received for the shares at the end of the two years and the compound interest he received for the fixed deposit at the end of two years is greater than the simple interest he has to pay for the loan in the above part (a).

(04) (a) (i) BEDC is a composite Trapezium shaped lamina which composed by joining a parallelogram shaped lamina ABCD and a triangular shaped lamina ADE respectively. AE = 8 cm and CD = x. The length of the side AB is twice the length of CD. If the area of the composite plane figure is 22 cm^2, then show that x satisfies the quadratic equation $\boldsymbol{x^2 + 2x - 11 = 0}$



(ii) Solve the quadratic equation in (i) above by the method of completing the square or by any other method, and taking $\sqrt{3} = 1.73$, Find the length of the base of the parallelogram.

(iii) If the area of the parallelogram ABCD is equal to the area of the triangle ADE, find the value of x.

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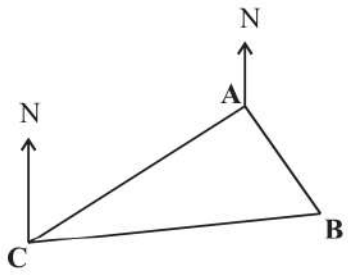
(05) A ship "**A**" starts his journey from the habour **C** and travels with the speed of 50 km^{-1} of the bearing of 050^0 . At the same time the ship "**B**" starts its journey from the same horbour and travels with a higher speed than the ship "**A**" with the bearing of 080° After one hour of starting their journey, the bearing of the ship B is 140° as seen from the ship **A**.

(a) Mark the information on the given diagram and find the magnitude of $A\hat{C}B$ and $C\hat{A}B$.



(b) (i) Using the trigonometric tables, calculate the distance between two ships after one hour to the neatest whole number.

(ii) By traveling through the same way, the ship A reaches, to the harbour D. At that moment the distance between the ship B and the harbour D is 70 km. Then calculate the $A\hat{D}B$.

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(06) The frequency distribution given below shows the information about the number of shirts produced by a certain Garment Factory within 25 days of a certain month.

Number of shirts	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50	51 - 60	61 - 70
Number of days	1	2	4	10	4	3	1

(i) Write the modal class.

(ii) Find the mean number of shirts produced in a day to the nearest whole number and hence calculate the number of shirts produced in 3 months with 25 working days per month.

(iii) Rs. 150 is obtained by selling a shirt. Calculate the minimum profit expected by selling shirts in a month of 25 days.

Part B

(07) Ten questions are given for the each competitors in Mathematics quiz competition. After giving the answer for a question, next question is given. The amount of money given for the each question, is considered as the terms of an arithmetic progression. Rs. 750 is given for the correct answer for the first question and Rs. 2500 is given for the correct answer for the 8^{th} question.

(i) Find the common difference of the given arithmetic progression. Show that the four times the amount of money of the correct answer for first question is given for the correct answer of the 10^{th} question

(ii) If Suneth has answered all the 10 questions correctly, show that Rs. 18 750 is given for the correct answers for all the 10 questions.

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(08) Use only a straight edge with a 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 = 7 cm, BC = 5 cm and $\hat{ABC} = 60°$

(ii) Construct the perpendicular bisector of AC and construct the quadrilateral ABCD such that AD = CD = 6.5 cm

(iii) Construct the parallel line to AC through the point D and name the intersection point of it and BA produced as E.

(iv) Join EC and prove that Δ BCE $= \square$ ABCD

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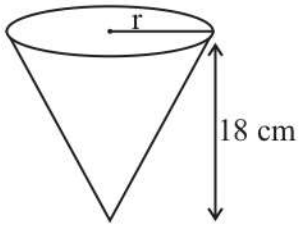
(09) (a) A conical shaped glass vessel of base radius r cm and height 18 cm was kept as shown in the figure and filled with water.

(i) Show that the volume of water in the glass vessel is $6\pi r^2$

(ii) Water in the above vessel is completely poured into an empty cuboid shape vessel that has a square base of side a cm. The water fills the cuboid shaped vessel up to a height of h cm. Show that $h = 6\pi \left(\frac{r}{a}\right)^2$



(b) Taking that $6\pi = 18.84$, r = 10.5 cm and a = 14 cm and using logarithmic tables, find the value of h to the nearest whole number.

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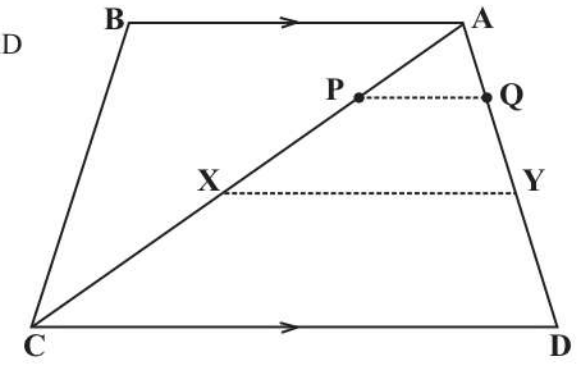
(10) In the trapezium ADCD shown in the figure AB // DC and AB = ¼ DC. Points P and Q are placed on the side AD and AC respectively such that AP : PD = 1 : 3 and 4 AQ = AC.

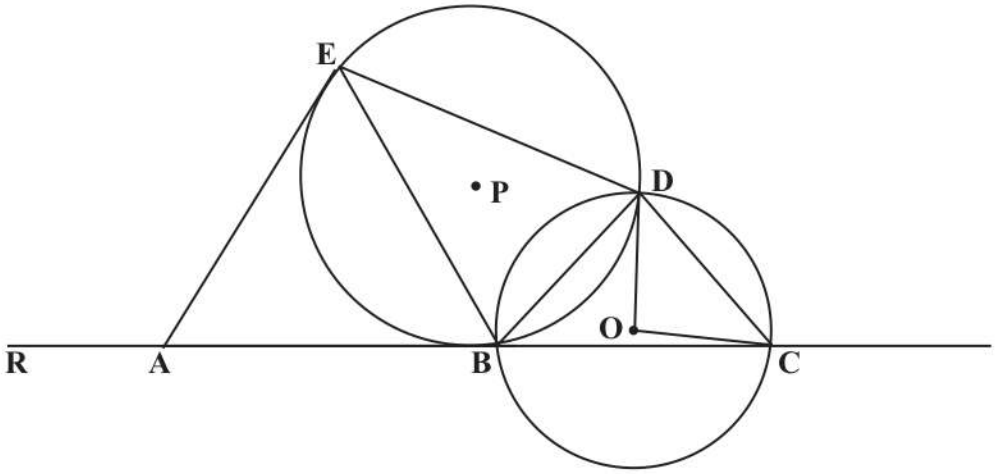
(i) Show that PQ // AB

(ii) If x and y and the midpoints of the sides AC and AD respectively, prove that PQ = ¼ DC.

(iii) Prove that ABPQ is a parallelogram.



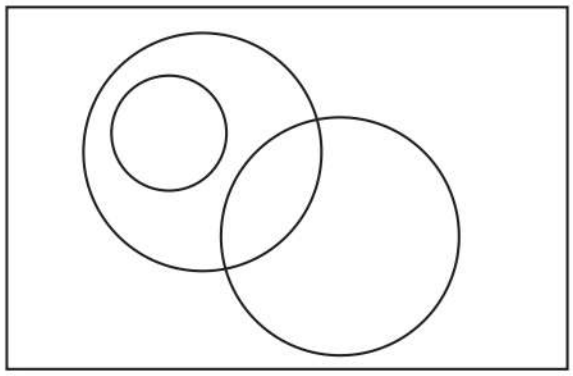
(11) In the given figure, the tangent drawn to the circle with centre P at the point B is ABC. E is a point such that AB = AE. C and D are two points on the circle with the centre O. If BE = BD, prove that $\hat{COD} = \hat{RAE}$.



(12) Information about the cultivators who grow Orchid, Anthurium and Rose of an association of the flower cultivators is given below.

- Number of Orchid cultivators = 10
- Number of Anthurium cultivators = 18
- Number of Rose cultivators = 09
- All the cultivators who grow Orchid, grow Anthurium as well.

  There are no any cultivators who grow both Orchid and Rose.



(i) Copy the given Venn diagram in your answer script and name the sets of cultivators who grow Orchid, Anthurium and Rose suitably.

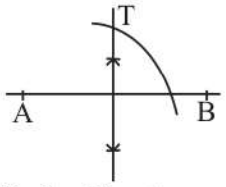
(ii) Out of all the cultivators, If 13 cultivators grow two types of flowers, Calculate the number of cultivators who grow Rose and Anthurium.

(iii) How many cultivators grow only Anthurium ?

(iv) If 17 cultivators do not grow Anthurium, Calculate the number of cultivators who do not grow either of the above three types of flowers.

Answer Sheet

Paper I - Part II

01.	Rs. 1792 Taking192	01	02
02.	$a = 20^0$ Identifying $A\hat{C}D = 40^0$	01	02
03.	$2x^2 + 2x + x + 1$ $2x(x + 1) + 1(x + 1)$ $(x + 1)(2x + 1)$	01 01	02
04.	39 cm $2 \times \frac{22}{7} \times 14 \times \frac{1}{8} + 2 \times 14$	01	02
05.	$x = 46^0$ $QTR = 76^0$, $P\hat{T}Q = 104^0$	01	02
06.	$2x^2$		02
07.	20 cm $\frac{250}{12.5}$	01	02
08.	12 cm $\frac{1}{2} \times AC \times 4 = 24$	01	02
09.	$8x^2y^2$		02
10.	6 Identifying $Q_1 = 7$ or $Q_3 = 13$	01	02
11.	$x = 7$ $y = 880$	01 01	02
12.	Rs. 2576 Rs. 224 or $\frac{92}{100} \times 2800$	01	02
13.	$D\hat{C}F = 110^0$ $D\hat{A}C = 70^0$ or $B\hat{C}D = 70^0$	01	02
14.	$x = 2$ $\frac{x - 1}{2} = \frac{1}{2}$ or $x - 1 = 1$	01	02
15.	5 Representing 7 or 3 in the relevant region.	01	02
16.	28cm FD = 6 cm and ED = 8 cm	01	02
17.	✓ ✓ x		02
18.	30 Minutes $\frac{24}{2.4} \times 3.0$	01	02
19.	5 cm AC = 10 cm $AC^2 = 8^2 + 6^2$	01	02
20.	Gradient = 1 Intercept = 2	01 01	02
21.	$A\hat{C}O = 20^0$ Identifying $A\hat{B}C = 70^0$ or $A\hat{C}B = 90^0$	01	02
22.	4 Days Obtaining Man days 12 or 24	01	02
23.	(i') 0 (ii) $\frac{9}{12} = \frac{3}{4}$	01 01	02
24.	(i') r = 2 (ii) 2^{14}	01 01	02
25.	 AB Perpendicular Bisector Marking T	01 01	02
			50

Paper I - Part B

(01)	Remainder $= 1 - \frac{2}{5} = \frac{3}{5}$	01	
	To Son $= \frac{3}{5} \times \frac{5}{9}$	01	
	$= \frac{1}{3}$	01	03
	(ii) To son and daughter $= \frac{1}{3} + \frac{2}{5}$	01	
	$= \frac{5 + 6}{15} = \frac{11}{15}$	01	
	$= 1 - \frac{11}{15} = \frac{4}{15} \rightarrow 2$ ha	01	
	Whole area of the land $= \frac{2}{4} \times 15$	01	
	$= 7.5$ ha	01	05

(iii) When dividing equally $\frac{7.5}{3}$ — 01

$= 2.5$ ha

The area of the land not Receiving for the daughter $= 2.5 - 2$ — 01

$= 0.5$ ha — 01 — 03

10

02 (a) Annual rate $= \frac{6}{100} \times 70\,000$ — 02

$= 4\,200$

(ii) For a Quarter $= \frac{4200}{4}$

$=$ Rs. 1050 — 02 — 04

(b) (i) Income tax $= \frac{4}{100} \times 500\,000$ — 01

$=$ Rs. 20 000 — 01 — 02

(ii) Income tax for third income

$= 32\,000 - 20\,000$

$=$ Rs. 12 000 — 01 — 01

Taxable income $= \frac{100}{4} \times 12000$ — 01

$=$ Rs. 300 000 — 01 — 02

Total annual income $=$ Rs. 500 000

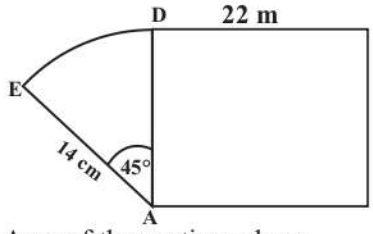
$=$ Rs. 500 000

$=$ Rs. 300 000

$=$ රු. 1300 000 — 01 — 01

10

03



— 01

(i) Area of the portion where gotukola is grown $= \frac{22}{7} \times 14 \times 14 \times \frac{1}{8}$ — 02

$= 77$ cm^2 — 01

(ii) Area of the rectangular portion $= \frac{77 \times 4}{14}$ — 01

$= 22$ m — 01

(iii) Length of the arc DB $= 2 \times \frac{22}{7} \times 14 \times \frac{1}{8}$ — 01

$= 11$ cm — 01

(iv) Perimeter

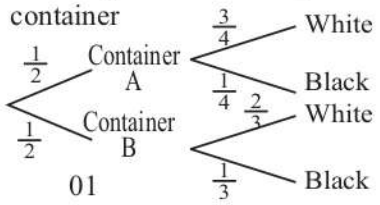
$= 11 + 14 + 14 + 22 + 22$

$= 83$ cm — 02

10

04 (a)

(i) Selecting the container — Drawing a ball



01 — 01 — 03

(ii) $\left(\frac{1}{2} \times \frac{3}{4}\right) + \left(\frac{1}{2} \times \frac{2}{3}\right)$ — 01

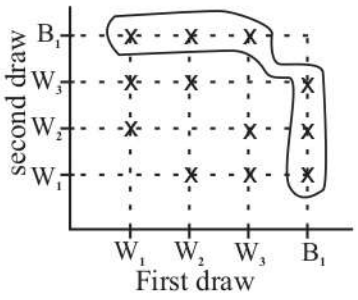
$\frac{3}{8} + \frac{1}{3}$

$\frac{9+8}{24}$ — 01

$\frac{17}{24}$ — 01 — 03

(b)

(i)



— 02

(ii) $\frac{6}{12} = \frac{1}{2}$ — 02 — 04

10

05 (a) 50 , 10 — 02

Correct CF curve. — 02

$= Q_3 - Q_1$

$= - -$ — 02 — 06

(b)

$=$ -

(i) $\frac{1}{4}$ — 01

(ii) Angle $= \frac{360}{40} \times 15$ — 02

$= 135°$ — 01

10

Answer Sheet

Paper II Part A

01

(a) (i) $y = -1$ — 01

(ii) Correct scale — 01
Marking 5 points correctly — 01
Smooth curve. — 01 — 04

(b) (i) $x = 1$ — 01 — 01

(ii) $y = (x-1)^2 - 2$
$a = -1$ — 01
$b = -2$ — 01 — 02

(iii) $x = -0.4 \quad x = +2.4$ — 01
$(x-1)^2 - 2 = 0$
$(x-1)^2 = 2$
$x - 1 = \pm\sqrt{2}$
$-0.4 - 1 = \pm\sqrt{2}$ — 01
-1.4
$2.4 - 1 = \pm\sqrt{2}$
1.4 — 01 — 03

10

02

(a) $\frac{4}{(x+3)(x+2)} - \frac{1}{(x+2)}$ — 01

$\frac{4-(x+3)}{(x+3)(x+2)}$ — 01

$\frac{4-x-3}{(x+3)(x+2)}$ — 01 — 03

Amount of fuel bought by Kamal $= x$
Amount of fuel bought by Sanduni. $= y$

$x - y = 8$ ——— ① — 01

$450x + 450y = 7200$ — ② — 01

① x 450

$450x - 450y = 3600$ — ③ — 01

② + ③

$900x = 10\,800$
$x = 12$ — 01
$x = 12$ ① හි ආදේශය
$x - y = 8$
$12 - y = -8$ — 01
$12 - 8 = y$
$4 = y$ — 01

Amount of fuel bought by Kamal $= 12l$
Amount of fuel bought by Sanduni $= 4l$ — 01 — 07

10

03

(a)

(i) Total interest $= \frac{12}{100} \times 275\,000 \times 2$ — 01
$= 66\,000$ — 01 — 02

(b) Numbers of shares $= \frac{175\,000}{25}$
$= 7000$

Dividends income for two years. $= 7000 \times 12.50 \times 2$ — 01
$= 35000$ — 01

Amount invest in the bank that pay compound interest $= \frac{15}{100} \times 100\,000$ — 01
$= 15000$

Interest for the second year.
$= \frac{15}{100} \times 11\,500$ — 01
$= 17\,250$ — 01

Total interest $= 15\,000 + 17250$
$= 32\,250$ — 01

Total income $= 35\,000 + 32\,250$
$= 67\,250$ — 01
$67\,250 > 66\,000$

Earn more than the simple interest as part (a) — 01 — 08

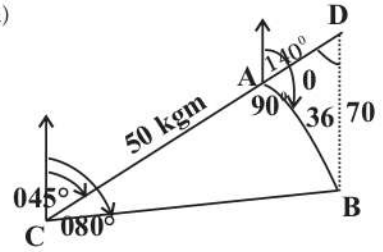
10

04

(a) $22 = \frac{1}{2} \times x(2x + 2x + 2)$ — 01
$44 = 4x^2 + 8x$ — 01
$11 = x^2 + 2x$ — 01 — 03
$0 = x^2 + 2x - 11$
or any other correct method.

(b) $x^2 + 2x = 11$
$x^2 + 2x + 1 = 11 + 1$ — 01
$(x^2 + 1)^2 = 12$
$x + 1 = \pm\sqrt{12}$ — 01
$x + 1 = \pm 2\sqrt{3}$
$x + 1 = \pm 2 \times 1.73$
$x + 1 = \pm 3.46$ — 01

$x + 1 = 3.46$ or $x + 1 = -3.46$
$x = 3.46 - 1$ $\quad$ $x = -3.46 - 1$
$x = 2.46$ $\quad$ $x = -4.46$ — 01
Length is a positive value
$x = 2.46$ cm — 01 — 05

	(iii) $2x^2 - 4x = 0$ $2x(x-2) = 1$ $2x = 0$ or $x - 2 = 0$ $x = 0$ $x = 2$ $x = 2$ cm	01 01	 02 **10**
05	(a)  Marking 045^0, 080^0, 50km $A\hat{C}B = 80° - 45° = 35°$ $C\hat{A}B = 360° - (140° + 130°)$ $= 90°$ (b) $\tan 35° = \frac{AB}{50°}$ $0.7002 = \frac{AB}{50°}$ $35.01 = AB$ 35 km = AB (c) $\text{Sin } A\hat{D}B = \frac{35}{70}$ $\text{Sin } A\hat{D}B = 0.5$ $A\hat{D}B = \sin^{-1} 0.5$ $A\hat{D}B = 30°$	 02 01 01 01 01 01 01 01 01	 04 03 03 **10**
06	(i) 31 – 40 (ii) Class interval / Mid value / f / fx 1 – 10 / 5.5 / 1 / 5.5 11 – 20 / 15.5 / 2 / 31.0 21 – 30 / 25.5 / 4 / 102.0 31 – 40 / 35.5 / 10 / 355.0 41 – 50 / 45.5 / 4 / 182.0 51 – 60 / 55.5 / 3 / 166.5 61 – 70 / 65.5 / 1 / 65.5 $\varepsilon f = 25$ $\varepsilon fx = 907$	01	

	Mean number of shirts $= \frac{\varepsilon fx}{\Sigma f}$ $= \frac{907}{25}$ $= 36.28$ $= 36$ Number of shirts $= 36 \times 25 \times 3$ $= 2700$ (ii) $(1 \times 1) + (11 \times 3) + (21 \times 4) + (31 \times 10) + (41 \times 4) + (51 \times 3) + (61 \times 1)$ $= 806 \times 150$ $= 120\,900$ Mid value Coloumn Fx co.umn εfx	01 01 01 01 01 01 01 01 01	 10 **10**
07	(i) $a = 750$ or substituting $T_n = a + (n-1)d$ $a + 7d = 2\,500$ $750 + 7d = 2500$ $7d = 2500 - 750$ $7d = 1750$ $d = \frac{1750}{7}$ $d = 250$ $T_n = a + (n-1)d$ $= 750 + (10-1)\,250$ $= 750 + 2\,250$ $= 3000$ $= \frac{3000}{750}$ $= 4$ (ii) $S_n = \frac{n}{2}\{2a + (n-1)d\}$ $= \frac{10}{2}\{2 \times 750 + (10-1)\,250\}$ $= 5(1500 + 2250)$ $= 5 \times 3750$ $= 18\,750$	01 01 01 01 01 01 01 01 01 01	 07 03 **10**

Answer Sheet

08

(i) Constructing AB = 7 cm — 01
Constructing $\hat{ABC} = 60^0$ — 01
constructing BC = 5 cm and Constructing triangle ABC — 01 — 03

(ii) Constructing the perpendicular bisector of AC — 01
Marking the point D — 01
Constructing the quadrilateral ABCD — 01 — 03

(iii) Constructing parallel lines. — 01
Marking E — 01 — 02

(iv) AECΔ = ADCΔ (Same base and in between the same pair of parallel lines) — 01
AECΔ+ ABCΔ = ADCΔ+ABCΔ
BCEΔ = ABCD ▱ — 01 — 02

10

09

(a)

(i) Volume of the cone $= \frac{1}{3}\pi r^2 h$ — 01
$= \frac{1}{3}\pi r^2 \times 18$ — 01 — 02
$= 6\pi r^2$

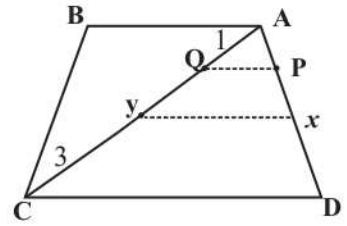
(ii) Volume of water in the cuboid $= a^2h$ — 01
$a^2h = 6\pi r^2$ — 01
$h = \frac{6\pi r^2}{a^2}$ — 01 — 03
$h = 6\pi\left(\frac{r}{a}\right)^2$

(b) $h = \frac{18.84 \times (10.5)^2}{14^2}$ — 01 — 03

$h = \lg 18.84 + 2\lg 10.5 - 2\lg 14$
$= 1.2751 + 2 \times 1.0212 - 2 \times 1.1461$
$= 1.2751 + 2.0424 - 2.2922$
$= 1.0255$
$=$ antilog 1.0255 — 01
$= 10.6$
$= 11$ cm — 01 — 02

10

10



01

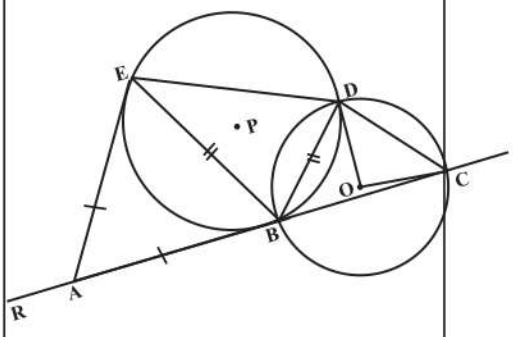
(i) To prove that PQ // AB
proof AP : PD = 1 : 3 — 01
AQ : QC = 1: 3 — 01
∴ AP : PD = AQ : QC
PQ // CD — 01
AB // CD (ABCD is a parallelogram)
∴ PQ // AB — 01 — 05

(ii) To prove that PQ = ¼ DC
Proof $xy = \frac{1}{2}$ CD (x & y are mid points.) — 01
PQ = ½ xy (Axy Δ Mid point PRQ) — 01
PQ = ½ x ½ CD — 01 — 03
PQ = ¼ CD

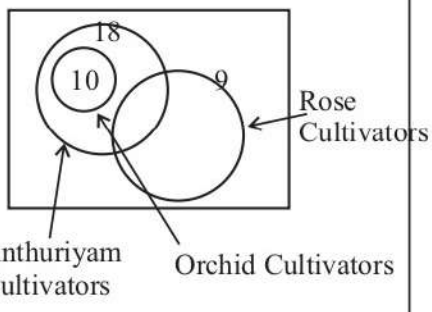
(iii) To prove that ABPQ is a parallelogram
proof PQ = ¼ CD (Above proof)
AB = ¼ CD (Data) — 01
∴ AB = PQ — 01 — 02
AB // PQ (Above proof)
∴ ABCD is a parallelogram

10

11



Marking data on the diagram — 02 — 02

	To prove that $\hat{COD} = \hat{RAE}$		
	proof $\hat{COD} = 2\,\hat{DBC}$ —— ①	01	
	The angle subtended at the centre is twice the angle subtended at the remaining part of the circle.		
	$\hat{DBC} = \hat{BED}$ (Angles in the alternate segment)	01	
	$\hat{BDE} = \hat{BED}$ (BE = BD)	01	
	$\therefore\ \hat{DBC} = \hat{BDE}$		
	$\hat{ABE} = \hat{BDE}$ (Angles in the alternate segment)		
	$\therefore\ \hat{ABE} = \hat{DBC}$	01	04
	$\hat{ABE} = \hat{AEB}$ (AB = AE)	01	
	$\hat{RAE} = \hat{ABE} + \hat{AEB}$ Theorem of external angles	01	
	$\hat{RAE} = 2\,\hat{ABE}$	01	
	$\therefore\ \hat{RAE} = 2\,\hat{DBC}$ —— ②	01	04
	① = ②		
	$\therefore\ \hat{RAE} = \hat{COD}$		**10**
12			
	(i) Naming Sets	02	
	Marking 18, 10, 9	02	
	(ii) 13 – 10 = 3	02	
	(iii) 18 – (10 + 3) = 5	02	
	(iv) 17 – 6 = 11		