PROVINCIAL DEPARTMENT OF EDUCATION

NORTHERN PROVINCE

3rd Term Examination

MATHEMATICS I **G.C.E(O/L) -2025** **Two Hours**

.....

Name of Student

.....

Index Number

IMPORTANT

- This question Paper consists **8** pages.
- Write your **index number** correctly in the appropriate places **on this page** and on **page three.**
- Answer the **all** on **questions paper itself.**
- Use the space provided under each question for working and writing the answer.
- Indicate the **relevant steps** and the **correct units** when answering the questions.

Marks are awared as follows
In Part IA

- 2 marks for each questions

In Part IB

- 10 marks for each questions

For marking Examinar' use only		
Part	QuestionNumbers	Marks
A	1 – 25	
B	**1**	
	2	
	3	
	4	
	5	
Total		

Name of Teacher .....

Signature of Teacher .....

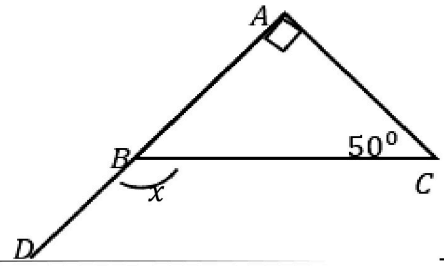
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PART I (A)

Answer all questions on this question paper itself

1. The annual assessed value of a shop located within the limits of an urban counsel is Rs 400 000. An annual rates percentage is 8%. Find the amount has to pay quarterly rate?

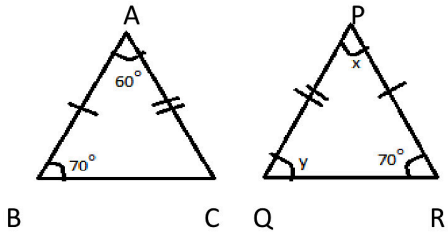
2. In the triangle ABC $\hat{A}$ *is a right angle.* $A\hat{B}C = 50°$ Find the value of x?



3. Solve $\frac{1}{2x} + \frac{1}{12x} = \frac{1}{12}$

4. Write $6 = 10^{0.7782}$ in logarithm form?

5. ABC and PQR are two congruent triangles. Find the value of x and y according to the information.



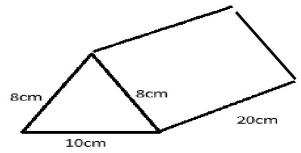
6. Factorize $2x^2 - 5x - 3$

7. In the class interval 31-40,
   I. Find the upper limit of it?
   II. Find the lower class boundary of it?

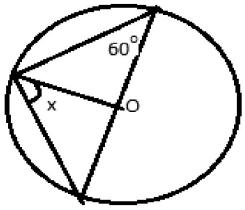
Class interval	Frequency
21-30	5
31-40	4
41-50	3

8. In a geometry progression, if the first term is (-3), second term is 9 then find the 5^{th} term as the power of (-3).

9. In the given diagram has been drawn the measurements of different faces?



10. O is a center of the circle.Using the given information Find the value of x?

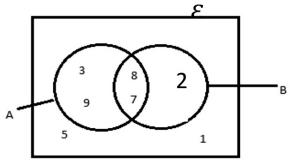


11. Underline the Correct statement using the given venn diagram?

I. $n(AnB^{|}) = 2$

II. $n(AnB) = 3$

III. $A^{|} = \{2,6,4\}$



12. Find the least common multiples (L.C.M) of following algebraic terms $8x^2y, 3xy^2, 2x$

13. A and B are two independant events $P(A) = \frac{1}{3},\ P(B) = \frac{1}{2}$

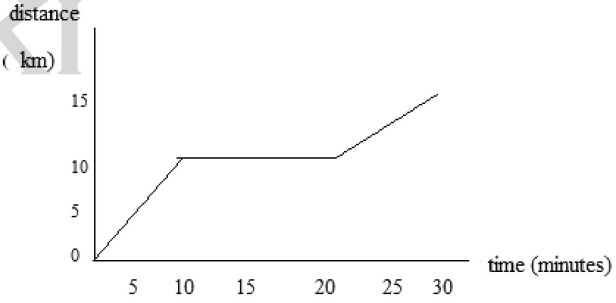
$i. Find\ the\ value\ of P(AnB)$

$ii.. Find\ the\ value\ of P(AUB)$

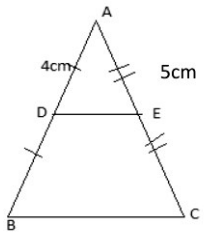
14. Simplify. $3x^2 \times 12y \div 9x$

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15. A person travelling in a mortor vehicle changes with time is shown in diagram. Find the speed of first 10 minutes in Km/h?

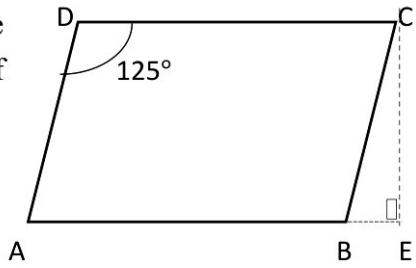


16. In the triangle ABC , D,E are midpoint of the side AB and AC respectively. If the perimeter of trapezium is 27cm. Find the length of Side BC?



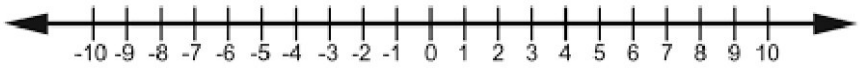
17. A=$\begin{pmatrix} 2 & -3 \\ -1 & 0 \end{pmatrix}$, B=$\begin{pmatrix} 1 & 3 \\ 2 & 1 \end{pmatrix}$, $2A + B = \begin{pmatrix} 5 & b \\ a & 1 \end{pmatrix}$ Find the value of a, b?

18. In the parallogram ABCD is shown. CE is drawn to the perpendicular to produce AB. If. $A\hat{D}\,C = 125°$ Find the value of $B\hat{C}E$?



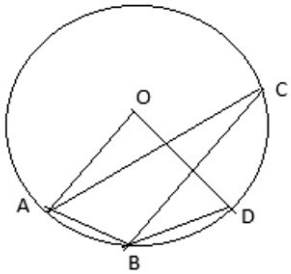
19. The circumference of base if the cylinder is 132cm and its area of curved surface is 2640cm^2 Find the height of cylinder?

20. Solve the inequality $3x - 2 \leq 4$ mark the positive integer solution in given numberline

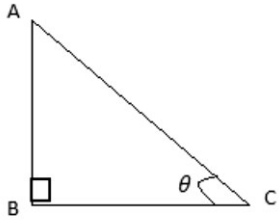


21. In the given diagram O is the center of the circle. and points A,B,C,D are on the circumference of the circle.mark True(√) or false(×) in the given statement

Reflex angle; $A\hat{O}D = 2A\hat{B}D$	
$A\hat{B}D + A\hat{O}D = 180^0$	



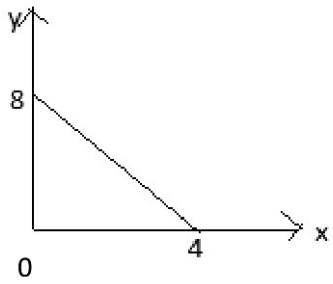
22. If $\sin\theta = 0.8660$ and $AC = 10cm$ Find the length of AB ?



23. In the given Cartesian plane

i. Find the gradient?

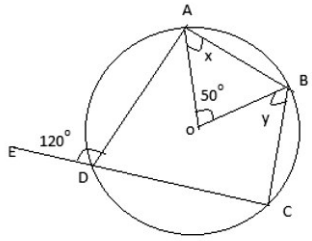
ii. Find the equation of straight line?



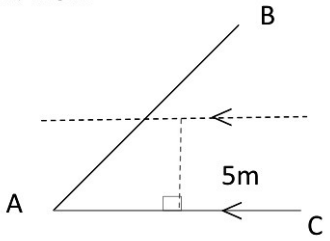
24. O is the center if the given circle $\hat{O}B = 50°$ $A\hat{D}E = 120°$.

i. Find the value of x?

ii. Find the value of y



1. In the given diagram mark the locus of a point P which equidistant from AB, AC and also 5m from AC ?



part 1 B

1. A road reconstruction to work provided to Complete 100 days in a contract base . That company Completed $\frac{3}{5}$ Part work at the first step in 60 days by using 10 men

   1. What fraction of the total work is the remaining work?

   2. If, in the second stage, $\frac{3}{4}$ of the remaining work is completed, what fraction of the total work will have been done?

   3. If the remaining work is completed in the third stage, what fraction of the total work will that be?

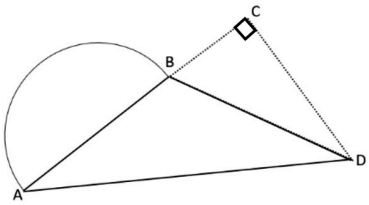
   4. If 20 people are assigned to do the second stage of the work and 25 people are assigned to do the third stage, explain with reasons whether the company will be able to complete the work within the given time period.

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2. The Figure Shows consisting of a triangle ABD and a semicircle with AB as its diameter.
Area of triangle ABD is 42 cm² and CD=6cm.

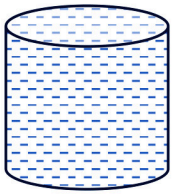
i. Find the AB.

ii. Find the area of the semi Circle



b. The figure shows a right cylindrical tank with Area of base 2m² and filled with water. a height of 2m. Completely

i. Find the capacity of the tank in l



ii. Calculate the time taken to completely emptied the water in the tank through an outlet Pipe uniform flow rate of 100 litres Per minute.

3. If Customs duty of 70% of the value of the items is charged when a television worth Rs 400000 is imported.

1. Find the amount that has to be paid as duty.

11. Find the Value of television after the Customs duty has been Paid.

b.A citizen has to Paid income tax his annual according to the table given below.

Annual income	Tax percentage
1st 500000	Tax free
Next 500000	4%
Next 500000	8%
Balance taxable income	12%

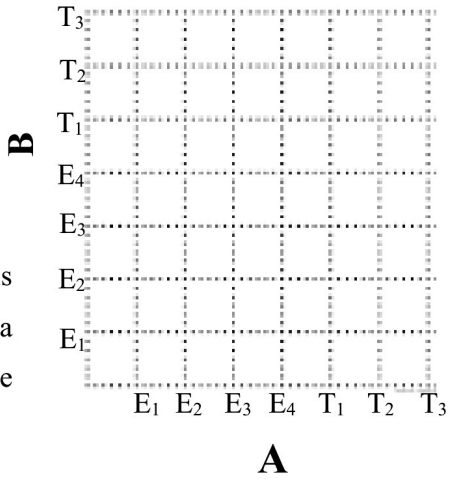
i. If Ramesh's annual income is Rs 1000000, find the income tax annually that he has to Pay?

ii. The total income tax Rs 10800 Paid by Karan.Find his annual income?

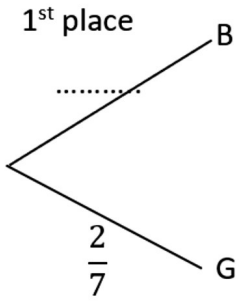
4. In a maths quiz competition. four English medium maths quiz books and three Tamil medium maths quiz books, all Identical in shape and Size, will be given as prizes to the winners. If A and B, who win in the competition, each receive one book Chosen randomly from the books as a prize

i. By Considering that the English medium books are denoted by E_1, E_2, E_3, E_4 and the Tamil medium books are denoted by T_1, T_2.T_3, represent the Sample space of the above mentioned random experiment On the given grid using the symbol "x"

ii. Encircle on the grid, the event of both of them received being the same medium books and find its Probability



b. If five male students and two female students selected for this Competition, denote the events of a male will win the first place or a female Student will win the first place, on the given Incomplete tree diagram

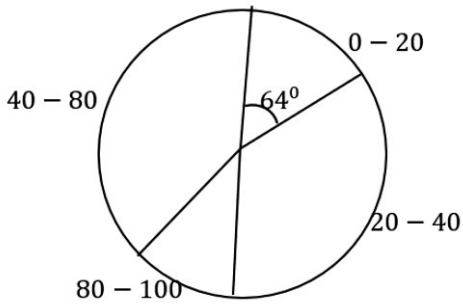


i. By extend the above thee diagram, represents with Probabilities the ways in which those Student's received mathematics quiz books in Tamil medium or English medium

ii. find the probability that the female student who will win the first place in this competition receives an English medium mathematics quiz book

5. An incomplete frequency distribution table chart about marks obtained and Pie by grade 11 students for a German mathematics Paper are given below

marks	Number of students	Cumulative frequency
0-20	16	16
20-40	…….	……
40-80	34	……
80-100	……	90



i. If the number of Students obtained marks in the interval (0-20) is 16 . Find the center angle of the sector that represents the interval (40-80).

ii. If the number of Students in the class interval (20-40) is three times of the number of Students in the interval (80-100). Fill in the blanks in the column of the table representing the number of students, according to the Information the given above

iii. Complete the Cumulative frequency column of the above table

iv. Drow the Cumulative Place frequency curve on the given Co-ordinte plane

v. using the cumulative frequency curve, find the number of Students who obtained more than 70 marks

Department of Education - Northern Province
G.C.E(O/L) - 2025
Third term Examination

Mathematics II **Time: 3Hours**

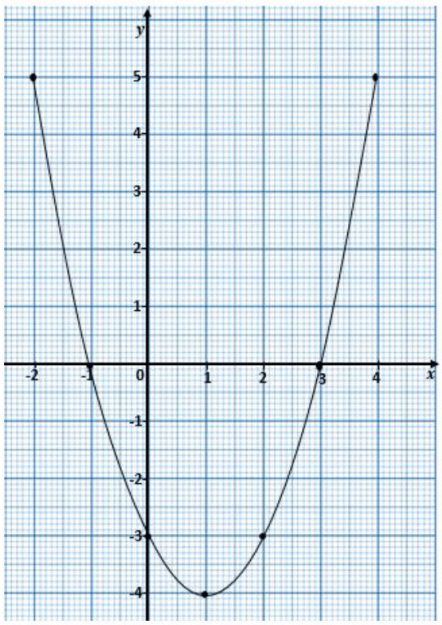
Instructions: **Additional Reading Time – 10 Minutes**

- Answer **10 questions** Choosing **five questions** from **part A** and **five questions** from **part B.**
- Indicate the needed steps and units when answering.
- Each question carries 10 marks and this paper carries 100 marks
- The volume of right circular cylinder of base radius r and the height h is $\pi r^2 h$.

Part A

1. Yaswin got a loan of Rs. 100 000 from a financial institution A at annual simple interest rate of 11%. He deposited Rs. 50 000 from the loan in another financial institution B at 12 % annual compound interest compounded annually. Then he invested the remaining amount of loan in a company C to buying shares at the market price of Rs. 100 per share. The company pays an annual dividend of Rs. 6 per share.
   i. Calculate the total amount that yaswin should pay to the financial institution A to settle the loan at the end of two years.
   ii. Find the total amount he will receive from the financial institution B at the end of two years.
   iii. At the end of two years Yaswin received the dividend income from the company C. As the market price of shares increased by 10 %, he sold all his shares at the increased price.
   iv. Which of his investments is more beneficial to him? By deposited in the financial institution or by invested in shares? Give reasons for your answer.
   v. Considering two years business transactions made by Yaswin with financial institutions A, B and the company C, determine whether he obtained an advantage or a disadvantage.

2. The Graph of a quedraitic function $y = f(x)$ is shown in the figure with the interval $-2 \leq x \leq 4$
   i. Write the equation of axis of Symmetry
   ii. Write down the coordinates of function,which is intersect the X-axis
   iii. Write the function $y = f(x)$ in the form $f(x) = (x + p)(x + q)$
   iv. If $y = a$ is intersect the graph at the points C & D.and coordinates of x of C,D have different notation,write the range of values of a?
   v. If above graph moving, the equation of newly graph is $g(x) = f(x) + 2$,write the coordinates of turning point of newly graph & write the equation of newly graph in form $g(x) = (x + h)^2 + k$

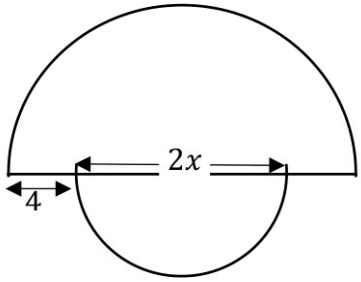


3. Details regarding the electricity units consumed by 50 families in a village during a particular month are shown in the following table.

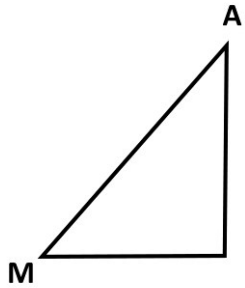
Number of units of electricity	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120	120 - 140
Number of families	5	6	9	12	8	4	6

i. What is the model class of the above frequency distribution?
ii. By taking mid value of model class as assumed mean, find the mean number of units of electricity that is consumed by a family in a month to the nearest whole number.
iii. Find the total number of units of electricity consumed by the above families in this village during this period.
iv. The Electricity Board states the "the maximum number of electricity units used by the families of this village does exceed 4000 units". Is this statement true? Explain with reasons.

4. Two semi – circular laminae of radii $x\ cm$ and $(x+4)\ cm$ are joined as shown in the figure. If the area of the composite shape is $39\pi\ cm^2$, show that x satisfies the quadratic equation $x^2 + 4x - 31 = 0$.
Solve this equation using completing square method and find the value of x to the nearest whole number. (take $\sqrt{35} = 5.91$)
Find the diameter of the larger semi – circle.



5.Sameer is at the top A of a vertical tower AB.Raafik who is 20m away from the bottom of the above tower on a horizontal ground and M observes theA with an angle of elevation $53°30'$



i. Copy this diagram on to your answer script and mark the data on it..
ii. Calculate the height of the tower to nearest metre using trigonometric ratio.
iii. Sameer moved 8m down from the top of the tower and observes Raafik with certain angle of depression at the point K.Calculathe the angle of depression
iv. If a wire is tied from the top of the tower to the point X which is on the horizontal ground 8m away from the bottom of the tower,show that $MK < AX$ (using Pythagoras theorem)

6.

a. There are two types of toffees in the boxes A and B.Total number of toffees in two boxes are 30. 7 toffees taken from the box A and put it into the box B.Now the number of toffees in the box Bis four times of the toffees in the box A.Take x as the number of toffees in the box A at initial and y as the number of toffees in the box B at initial
   i. Construet a pair of simultaneous equations
   ii. By solving them find separately the number of toffees in the boxes A and B at initial

b. Rs 500 enough to pavalan to bought 3 orange flavoured toffees each Rs 30 and bought q number of mango flavoured toffees each Rs 50 construct the suitable inequality and solve that find the maximum number of mango flavoured toffees can pavalan bought?

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P art B

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7. Vimal saves money daily by putting it into a piggy bank to buy a school bag. the total amount saved in the piggy bank at the end of the nth day is given by $S_n = 5n(n+3)$
   i. Find the amount of money in the piggy bank separately at the end of the first, second and third days?
   ii. The amount he deposits the piggy bank each day is of what type of progression
   iii. On the end of which day will the total amount in the piggy bank be Rs 1350?
   iv. Can Vimal buy a school bag worth Rs. 3700 with the money he saved in the piggy bank for twenty days? Give reasons.

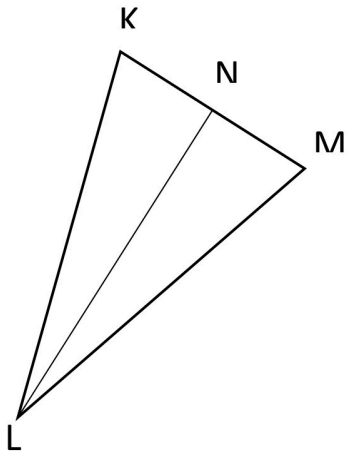
8. Use only a straight edge with a cm /mm scale and a pair of compasses for the following geometric constructions. The constructions lines should be drawn clearly.
   i. Construct the triangle ABC, such that $AB = 8cm$, $A\hat{B}C = 90°$ and $AC = 10\ cm$.
   ii. Construct the Angle bisecter of $B\hat{A}C$
   iii. Construct the circle which touches AB at B and also touches AC mark the centre as O.
   iv. Mark the point D.which circle touches AC and construct the tangent to parallel to AC..

9.

(a). A right circular cylindrical metal block of base with radius $10 \cdot 5\ cm$ and hight $15\ cm$ is melted and 15 identical small spheres are made.with radius r.In making these 197.5 cm^3 volume of metal is wasted .Taking show that the radius of sphere is given by $r = 5\sqrt[3]{7/11}$

(b). $A = \dfrac{\sqrt{72{\cdot}8} \times 0{\cdot}05}{1{\cdot}85}$ Find the value of A using the logarthms table

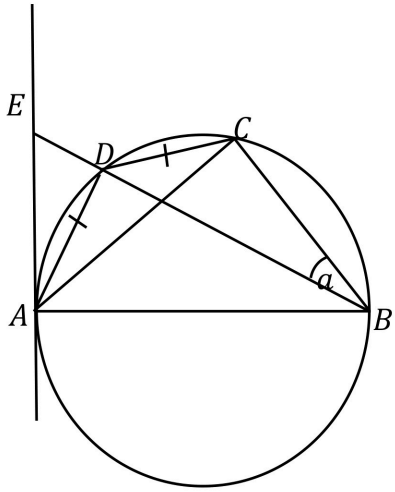
10. In the triangle KLM, the bisector of $K\hat{L}M$ meets the midpoint of the side KM at N.



   i. Copy the given figure onto your answer script and mark the information on it.LN is produced to P so that LN=NP, and join KP,MP
   ii. Show that produced $\Delta LMN \equiv \Delta KNP$.
   iii. Show that the quadrilateral $KLMP$ is a Rhombus.
   iv. Show that the area of the Rhombus $KLMP = \frac{1}{2}LP \times KM$

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11. As shown in the diagram, AB is a diameter of the circle. $AD = DC, C\hat{B}D = a$ and the tangent drawn to the circle at A meets BD produced at E.



i. Express $D\hat{A}E$ in terms of a.

ii. Express $B\hat{D}C$ in terms of a.

iii. produced BC and produced AE are meet at P.Show that CDEP is a cyclic quadrilateral.

12. Competitive examination consisting three papers IQ test,Language skills and Case study.A candidate should pass in all the 3 paper to attend the interview.

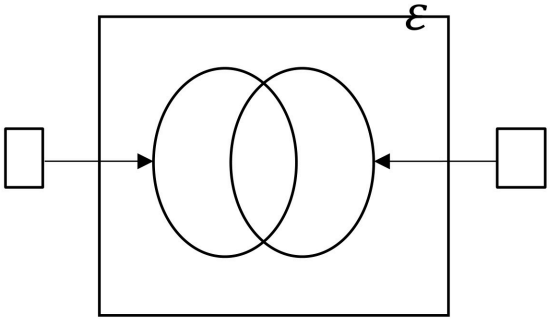
- Of 1000 who sat for the above exams,200 candidates passed in case study.
- All candidates who passed in either language skills or IQ test passed in case study
- 10% of candidates who passes all three subject, 5% passed only one subject, 2% passed only Iq test and case study.

i. Name the set A and B in the following venn dragram candidates.

$\varepsilon = \{$ Who passed in case study $\}$

$A = \{$ Who passed in Language skills $\}$

$B = \{$ Who passed in IQ test $\}$



ii. Denote the above data on above venn dragram

iii. How many candidates are eligible for the interview and shade that region

iv. How many Candidate who passed in only two papers

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