New Grade 11- 2021 Mathematics Diagnostic Test

பாடம் 1
Mathematics

ஜாதிக அதிகாரன கலாஜால
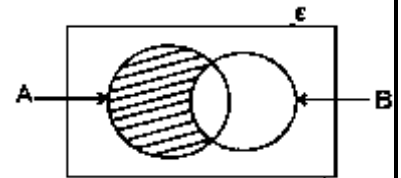**Zonal Education Galle**

Three Hours

Answer all the questions in Paper I and II

Paper I- Part A

(1). Find the distance travelled by a bus during 2 hours which travels 45 kilometers per hour?

(2). Express $\log_7 343$ in index form.

(3). Express the shaded region in set notation.

(4). Underline the most suitable value for the first approximation of $\sqrt{33}$
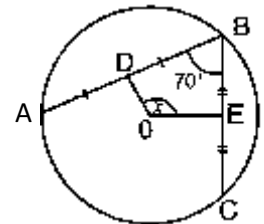
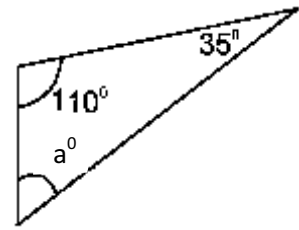   (i)   5.6   (ii) 5.7   (iii) 5.8   (iv) 5.9

(5). Solve. $\dfrac{3}{x} + \dfrac{1}{x} = \dfrac{1}{3}$

(6). D and E are the mid points of the chords AB and BC respectively of the circle with center O. Find x^0
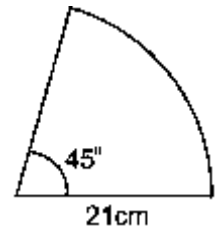

(7). Solve the inequality $3-2x \leq 9$

1

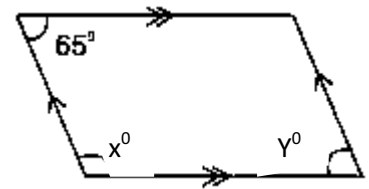(8). Find the value of a° according to the given information.

(9). Find the probability of getting a multiple of 2 when a fair die which marked 1 to 6 on its sides is tossed.

(10). Find the arc length of the given sector of the circle.

45"

21cm

(11). Find the values of x^0 and y^0 of the given parallelogram.

65⁰

x^0

Y^0

(12). The first term of an arithmetic progression is -44 and 16th term is 1. Find the common difference.

(13). Find the solutions of $x^2 + 6x - 7 = 0$

(14). Find the value of m^0 by using the given information.
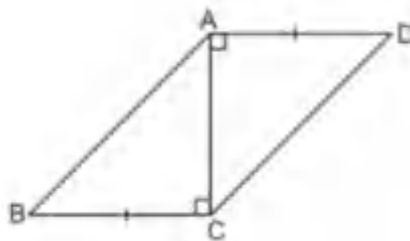

m^0 110⁰
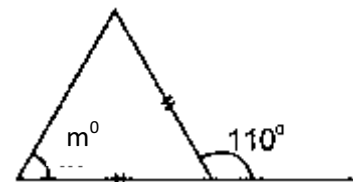
(15). Find the Least Common Multiple of P^2q, pq^2, pqr

2

(16).   A man lends Rs. 6000 at 11% simple interest per annum. Find the total amount to be paid after 2 years.

(17). $8x - 5y = 8$ Find the value of $(x+y)$ without solving these equations.
        $x + 14y = 1$

(18).   Mark $(\sqrt{})$ for the correct statements and (X) for incorrect statements.

| Triangles ABC and ADC are congruent under the case RHS	( )
Triangles ABC and ADC are congruent under the case SAS	( )
AD and BC are parallel.	( )

(19).   A man who is on the top of a light post A sees an equipment at B which is on the horizontal floor with an angle of depression of 50^0 . Represent this information in the given diagram.
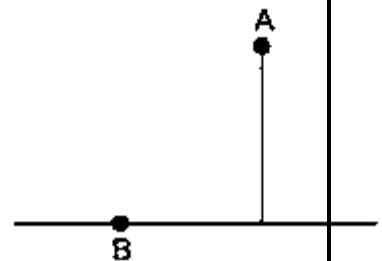
(20).   Find the value of a^0 of the circle with center O

3
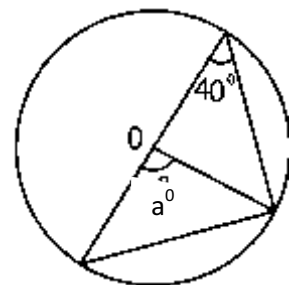
(21). Given is a sector of a circle of radius 14 cm and a right angled triangle .

Find the area of the triangle.
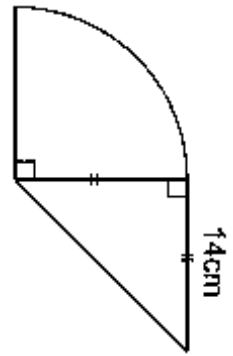
(22).

Find the gradient of the straight line PQ
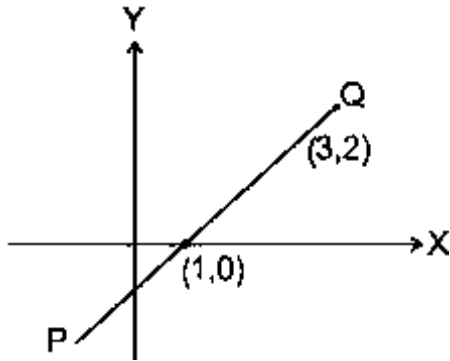
(23). Find the value of x^0 by using the given information.
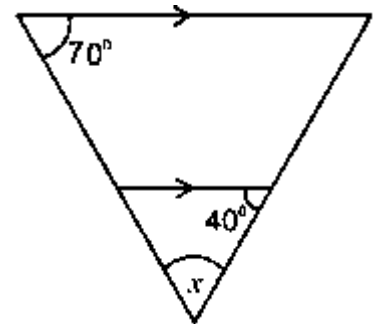
(24).Find the range of the given set of data.

10	22	38	25	49	12	37	42	19	32
47	21	19	20	24	18	47	26	31	10
11	33	24	35	42	27	15	49	44	26

(25). A and B are two points which are 5cm away from each other. Find two points which are 4cm away from A and 3cm away from B by using the knowledge of loci.

4
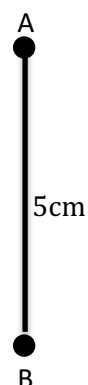
Paper I- Part B

(1) $\frac{1}{3}$ of the money which will be received for 2021 for a youth club is to be allocated for sports purposes, $\frac{2}{5}$ is for leadership training purposes and $\frac{1}{4}$ of the rest is for Shramadana campaign. .

  i)   What fraction of the whole is allocated for sports and leadership training purposes?

  ii)   What fraction of the whole is allocated for the Shramadana campaign?

  iii)   An amount of Rs. 60 000 which is remaining after all is spent for membership books and stationery, what is the amount to be spent for sports purposes?

  iv) $\frac{3}{5}$ of the amount for sports purposes is to be spent to buy sports items. Express that amount as a percentage of the whole amount.

(2) A quarterly payment of Rs. 1200 is paid by a certain electrical equipment shop. The respective local government charges 16% of the annual assessed value as the rates.

  (i)   What is the annual assessed value of the shop?

  (ii)   The imported value of a television in that shop is Rs. 48 000. A duty of 8% is charged when it is imported. What is the value of the television with duty?

  (iii)   When the sale of that television is done, a VAT percentage of 12% is added to the marked price.Mr. Perera who buys this television pays Rs. 67 200. Find the marked price.

(3) A person who carves wood cuts the following shape for a carving. It consists of a sector of a circle ABC and a right angled triangle DBE.

   (i) If AB = 14cm, find the arc length AC.
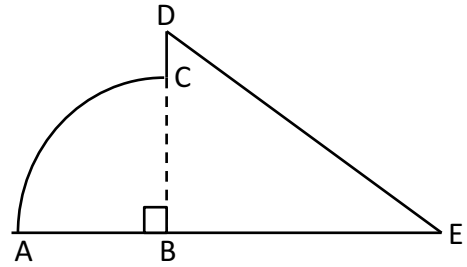
   (ii) If DB = 24cm , BE = 32cm and DE = 40cm find the perimeter of the whole sheet of wood.

   (iii) Find the total area of the sheet of wood.
      .

   (iv) The person charges Rs. 5 per $1cm^2$ of the triangular part and Rs. 10 per that of sector of the circle.Hence show that it is less than Rs. 4000 has to spend to buy this art work.
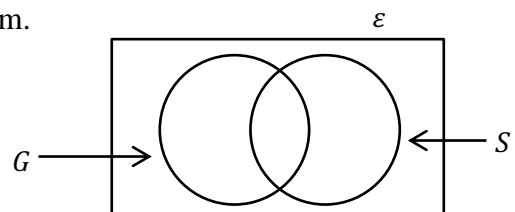
(4) There are 26 girls in Grade 11 of a mixed school.There are 5 girls among the 13 students who can swim.11 boys cannot swim.

   ε = { Students of the class }

   G = { Girls of that class }

   S   = { students who can swim }

   (i) Represent the above information in the venn diagram.

   (ii) Find the number of girls who cannot swim.

6

(iii)   How mny students are there in Grade 11?

(iv)   Describe the set $(SUG)^1$ in words.

(v)   Find the probability of a randomly selected student being a student who cannot swim.

(5)   Following is an incomplete pie chart about the cultivated area of a certain division in hectares.

(i)   The area where coconut is cultivated is three times that of rubber. Find the relevant angle for coconut.
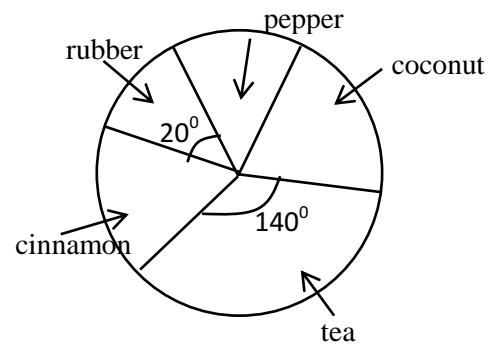
(ii) The area where pepper and cinnamon are cultivated are equal. Find the angle relevant for pepper.

(iii)If coconut is cultivated in 48 hectares , what is the total area?

(iv)Cinnamon is cultivated in another 20 hectares where tea was cultivated. Now find the new relevant angle for cinnamon.

★ **Answer all the questions on this paper itself.**

★ **The curved surface area and the volume of a cylinder of radius r and height h is $2\pi rh$ and $\pi r^2 h$ repectively.($\pi = \frac{22}{7}$)**

01. (a) A rectangular label of length 44cm and width 12cm is pasted to cover the curved surface of an imported salmon tin.

   (i) Find the radius of the base of the tin.

   _____

   _____

   _____

   (ii) Find the area of the base.

   _____

   _____

   _____

   _____

   (iii) Find the volume of the tin.

   _____

   _____

   _____

   _____

   _____

   (b) A, B and C are three points situated on the same a same straight line and CD is a vertical pole.The distance between A and B is 5m. The length of thewire from A to top of CD is 10m and the angle of elevation of D from B is 50^0 .

   (i) Represent the above information in a suitable scale diagram.

   _____

   _____

   _____

   _____

   _____

   _____

   _____
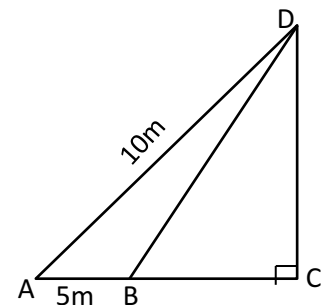
   (ii) Find the height of the pole DC

   _____

   _____

   _____

(iii)   Find the angle of elevation of D from A.

Q —————— X —————— R   02.   (a)
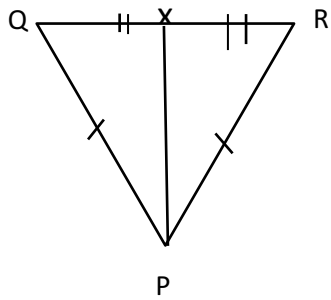
In PQR Δ , PQ = PR and PX is drawn such that QX= XR

Prove that,

(i)   PQX Δ ≡ PXR Δ

(ii) $QR \perp PX$

P

(b)
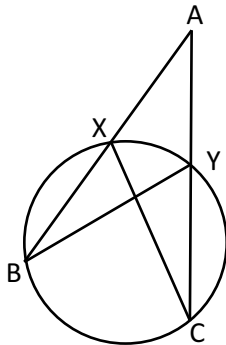
BY and CX two equal chords. Produced BX and CY meets at A.

(i)   Show that $A\hat{X}C = A\hat{Y}B$

(ii)   Prove that AB = AC

03. (i)   Construct the triangle ABC where AB = 6.5cm , $A\hat{B}C = 45^0$ and $B\hat{A}C = 60^0$

(ii) Construct the angle bisector of $A\hat{C}B$

(iii) If it intersects the side AB at D, construct the parallelogram CDBE.

(iv) Measure and write the length DE

04. Following is an incomplete table prepared to draw the graph of y = $2x^2$ - 5

x	-3	-2	-1	0	1	2	3
y	13	3	-3	…….	-3	3	13

(i) Find the value of y when x = 0

(ii) Draw the graph of the above function by taking 10 small divisions along x and y axis.

Using your graph,

(iii) write the minimum value of the function.

(iv) write the equation of the symmetrical axis.

(v) write the roots of the equation $2x^2 - 5 = 0$
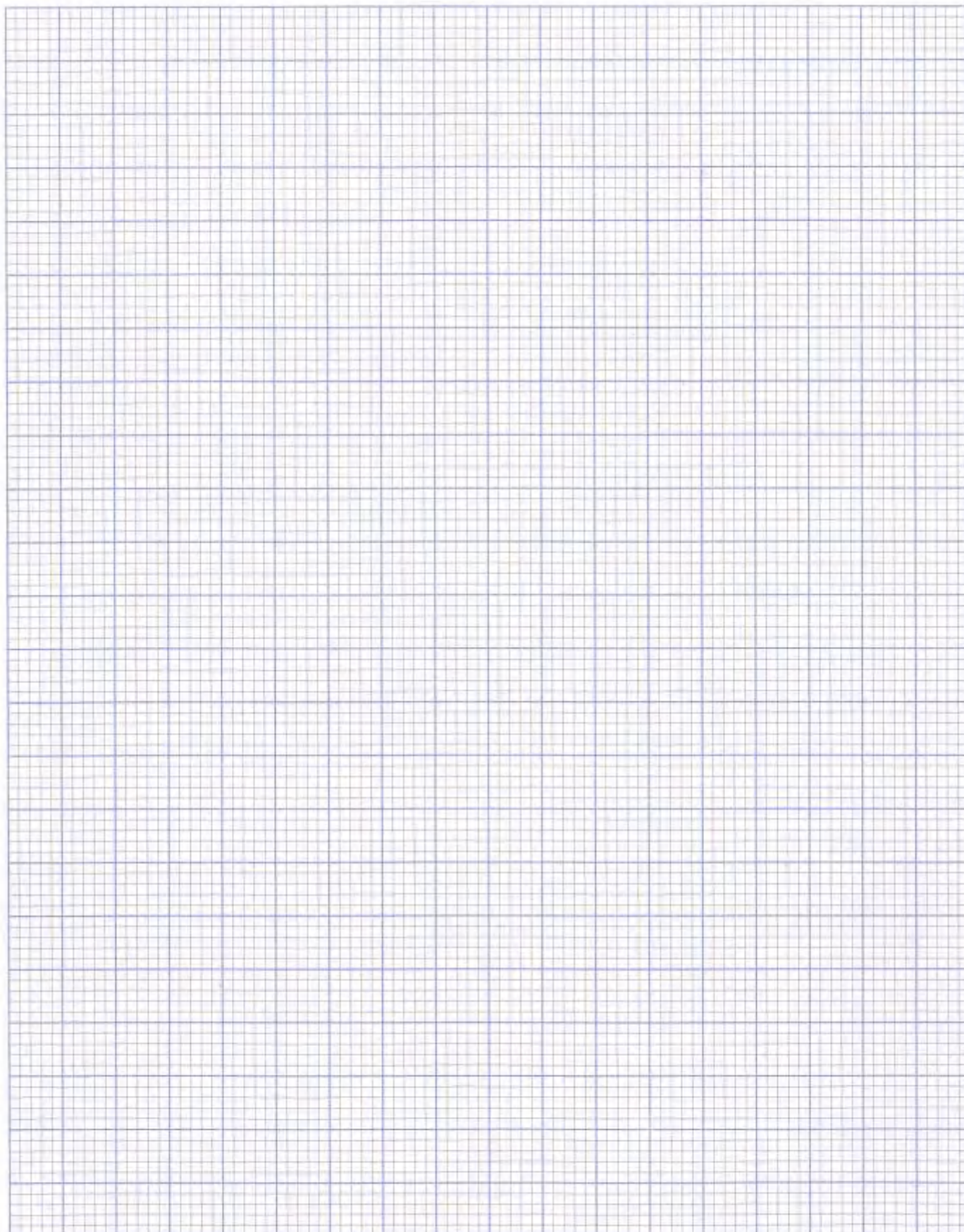
05. Given below is the amounts of beans received to a vegetable s during 100 days. (Here 10 – 20 means greater than 10 and less than or equal to 20)

Amount received per day(kg)	0 -10	10-20	20-30	30-40	40-50	50-60	60-70
No. of days	8	12	16	28	14	12	10

(i) Write the modal class.

(ii) Calculate the mean value of the amount of beans in kilo grams to the nearest kilo gram received per day by taking the mid value of the modal class as the assumed mean.

(iii) If Rs. 70 is paid for 1kg of beans find amount of money paid for beans during a month.