Zonal Education office - Dehiowita

Second Term Test - **2024** | **Grade 11**

Mathematics   I | **32   E   I** | **Time – Two Hours**

Index number ....

Certified correct

.......………………………………………

Signature of invigilator

Important

✳ This question paper consists of 8 pages.

✳ Write your index number correctly in the appropriate places on this page and on page three.

✳ Answer all questions on this question paper itself.

✳ Use the space provided under each question for working and writing the answer.

✳ Indicate the relevant steps and the correct units in answering the question

✳ Marks are awarded as follows.

In part A

2 marks for each question.

In part B

10 marks for each question.

For Marking Examiner's use only		
Part	Question number	marks
I A	1 - 25	
I B	1	
	2	
	3	
	4	
	5	
II A	1	
	2	
	3	
	4	
	5	
	6	
II B	1	
	2	
	3	
	4	
	5	
	6	
Total		

examiner :   ……………………………………

Part A
Answer all quections on this question paper itself.

1. The Percentage charged as a custom duty when a car is imported is 23%. Excluding tax its price is Rs.700 000, Find it's value with taxes.
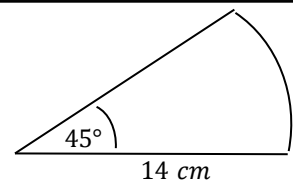
2. As indicated in the figure the side BC of the Triangle ABC Has been produced to D. If the bisector of $A\hat{C}D$ is CE, Find the magnitude of $E\hat{C}D$.
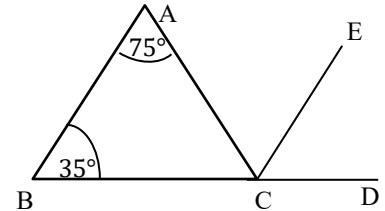
3. It takes 6 days for 4 men to complete a certain task. How many man days are required to complete the same task in 8 days?
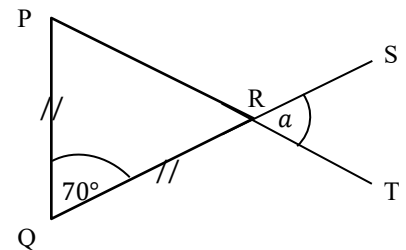
4. If, $lg\ x = 3$, Find the value of x.
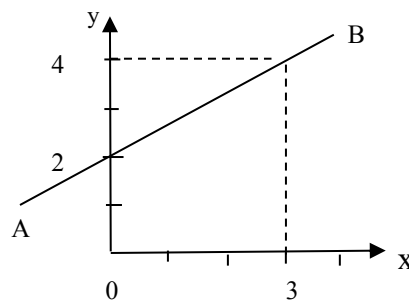
5. Find the perimeter of the given sector.

45°
14 cm

6. Find the L.C.M. of $9xy^2$, $12xy$, x^2y^2

7. Based on the information in the figure, find the magnitude Of $S\hat{R}T$.
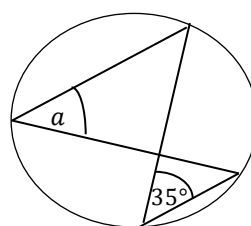
P
S
R
a
70°
T
Q

8. Find the factors of $3x^2 + 7x + 4$.

9. Find the gradient of the given line AB.

10. Simplify $\dfrac{3}{xy^2} + \dfrac{4}{x^2y}$.

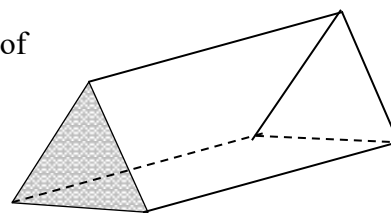11. Find the magnitude of a in the given figure.
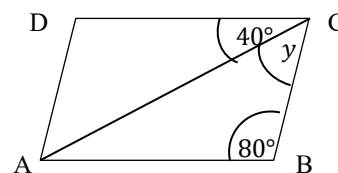

12. Solve and Find the value of x.

$$\dfrac{3}{x} - \dfrac{1}{2x} = 1$$

13. If $n(P) = 8$, $n(Q) = 15$ and $n(P \cup Q) = 19$, Find the $value \; of \; n(P \cap Q)$.

14. Find the area of the shaded triangular part if volume and length of
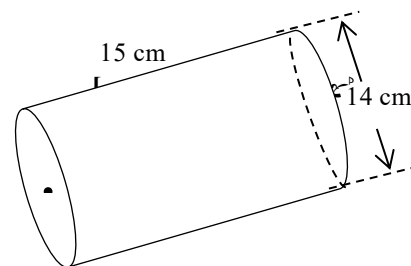The prism area $54 \; cm^3$ and $6 \; cm$ respectively.

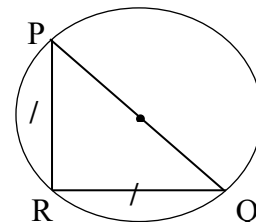15. ABCD is a parallelogram. Find the magnitude of y.

16. Solve and find the value for x.

$$x^2 - 9 = 0$$

17. Based on the given information, find the volume of the Cylinder. (volume of the Cylinder $\pi r^2 h$.)

15 cm

14 cm

18. Find the valve of the angle $P\hat{Q}R$ in this circle of which PQ is a diameter.
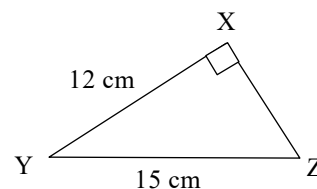
P

R   Q

19. A water tank of volume 960ℓ takes 8 minutes to fill completely. Find the rate of flow of water into it in liters per second.

20. C is the midpoint of the chotd AB of this circle with center O.

It AB = 12 cm and OC = 8 cm.Find the radius of the cirle.

A   O   C   B
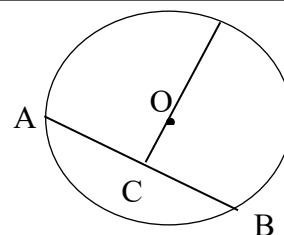
21. Based on the figure, find the length of XZ.

X

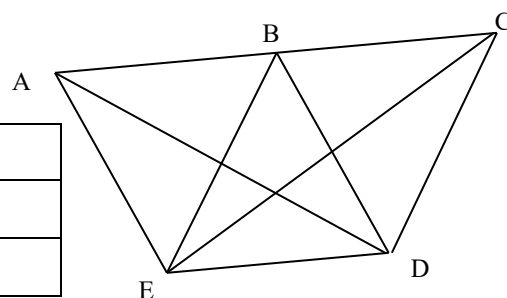12 cm

Y   15 cm   Z

22. Find which term is 107 in the arithmatic progression 7 , 12 , 17 , ...

23. ABDE and BCDE are two parallelgrams.

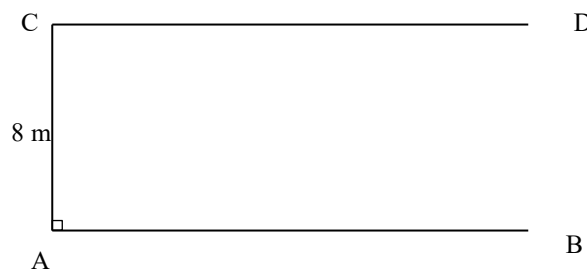Mark (√) for correct answers.

AB = BC	
Area of the parallelgram ABDE = Area of the Δ CDE	
$B\hat{A}E = C\hat{B}D$	

A   B   C

E   D

24. Finf the median of the set of numbers.

5 , 16 , 5 , 18 , 12 , 20

25. CD is a tapline 8 m away froma boundray AB at a constant distance. A tap should be fixed equidistant from boundaries AB and AC. Using the knowledge of loci mark the point E where the tap should be fixed.


Part B

Answer all the questions on this quection paper itself.

(01) A person spends $\frac{2}{5}$ of his money on food , $\frac{1}{4}$ on setting water and electricity bills and $\frac{3}{7}$ of the remaining amount is spent on buying books. .

   i. What fraction of whole amount of money spent on food and setting bills?

   ii. If he spends Rs. 12000 to buy books, What is the total amount of moneyhe had ?

   iii. Express the ratio between the amount left at the end and the amount spent on food in the simplest form.

(02) The logo shown here consists of a triangular part ABC And semicircular part of diameter BC.
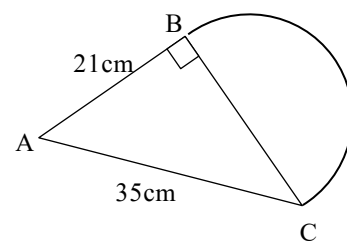
   i. Find the length of BC .

   ii. Find the arc length of the semicircle .

iii.   Find the perimeter of the logo.

iv.   Find the area of the logo.

v.   Draw a rough sketh of a rectangle BCDE on the same figure,ensuring that the area of triangle ABC and rectangle BCDE are equal, with one side of the rectangle bein BC.

(03)   Saman buys Rs. 100 000 warth of shares at Rs. 50 per each, from company "A". Which pays annual dividends of Rs. 5 per share.

i.   Find the number of shares bought by Saman.

ii.   Find the annual dividends income that Saman recives from company "A".

iii.   If Saman sold all his shares at the end of the year at Rs.60 each. Find the capital gain recived by Saman.

iv.   Accordinaly find the percentage of total profit received by Saman.

(04)   In a survey conducted it is found that out of 100 people, there were;
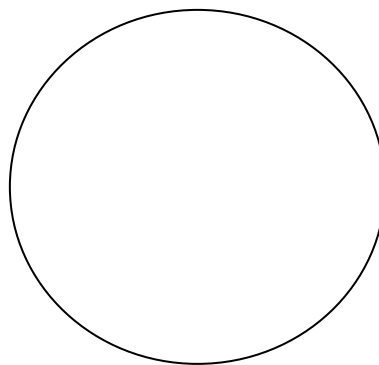
25   people who ate 'Kaum'.

15   people ate 'Kokis'.

45   people ate 'Athirasa'.

The remaining ate Bananas.

If they ate only one type of food,

i.   To represent the above information in a pie chart, find the angle at the centre of the sector representing the people who ate "Kaum".

ii.   Find the angle at the centre of the sector representing the people who ate "Kokis".

iii.   Represent the above information on the pie chart.

iv.   Find the number of people who ate the bananas .

(05)(අ) A selection test was held to select a class monitor and subject leader for grade 11, out of 3 boys and 2 grils.

i.   Indicate the ways in which two of them can be selected In the grid using the " × ".

ii.   Find the probability the monitor being a boy and subject leader being a girl..

(අ). To be selected to a course the probability that a group of candidates passing a competitive exam is $\frac{1}{8}$ and the probability of passing examination and the interview is 0.1

i. Complete the given incomplete tree diagram with the above information.

Passing the
exam

faling the
exam
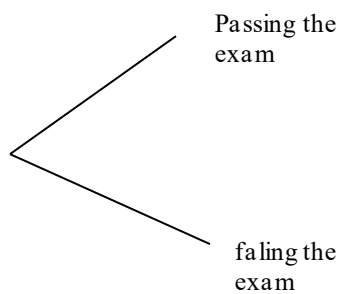
ii. Find the probability thata person who sat for this exam passes both the exam and the interview.

iii. Find the probability thata person who sat for this examination is not selected for this cource..

Zonal Education office - Dehiowita

Second Term Test- 2024 | Grade 11

Mathematics II | 32 E II | Time – Three Hours

Important

✳ **Answetr 10 question selecting 5 question from Part A and 5 questions from Part B.**

✳ Write the relevant steps and the correct units in answering the questions.

✳ Each question carries 10 marks.

Part A
Answer only 5 questions.

(01)

> A television wroth Rs. 45 000 is available for a down payment of
> Rs.9 000 and the balance should be paid in is equal monthly

Find the value of an installment to be paid by a person who buys a television at the annual intrest rate of 18 % on the reducing loan balance according to the above advertisment.

(02) An incomplete table prepared to draw the graph of the function in the format of $y = ax^2 + bx + c$ is given below.

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

(A) (i). Find the value of y when $x = -3$ from the symmetry of cordinates.

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

(B) From your graph,

i. Find the positive value of x *when* the value of the function is 0.5

ii. Find the range of values of x for which the function is increasing positively.

iii. Write down the coordinates of turning point and hence write this function in the form of $y = -(x + p)^2 + q$

(03)(A) Those under 12 years of age who participated in an educational trip were charged Rs.700 each and those above 12 years of age Rs.900 each as traveling expenses. There were 40 people who paticipated in the trip and total amount collected was Rs.30 400.

    i. Taking the number of persons under 12 years of age who took part in the trip as x and the number of persons over 12 years of age as y, construct two simultanious equations containing x and y.

    ii. By solving them, find the number of persons below 12 years of age and the number of persons above 12 years of age separately.

(ඇ) Make h the subject of the equation. $v = \sqrt{2gh}$

(04) Devinda observes the top of highvoltage Electrical post AB on a level ground from a point P with an angle of elevation of 42°. Then he moves another 30 m away from the post along AP and reaches Q. By taking 1 cm to represent 10 m, draw a scale diagram expressing the information given above.
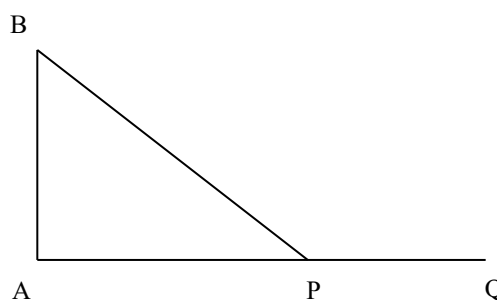
Find the height of the post AB and angle of depression of a when observed from B.

(05) The information about the weight of a group of applicants selected from a recruitment interview for the defence forces is as follows.

Weight (kg)	54-56	57-59	60-62	63-65	66-68	69-71	72-74
Number of applicant	2	5	14	20	12	4	3

    i. Write the class interval that includes the median.

    ii. Find the mean weight of an applicant.

    iii. A special recipe of Rs. 1400 per person was provided for those weighing less than 60 kg and Rs.1100 per person for the rest. Show that the total expenditure on food for this group for one month training period exceed 2 million rupees.

(06). A square piece of length x cm is cut out from one coner of a thin rectangular plate of length 8 cm. The width of the plate is $x + 4$ cm. If the area of the part that remains after being cut off is 38 cm², show that x satistics the equation.
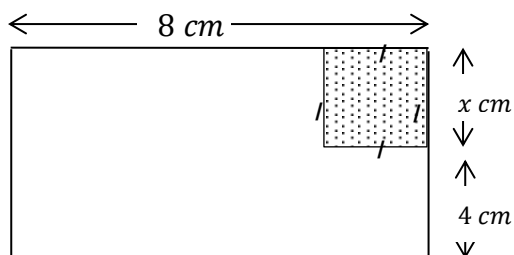
$x^2 - 8x + 6 = 0$

Find the length of a side of the removed square to one decimal place.

($x > 1\ cm$ and $\sqrt{10} = 3.16$)

Part B
Answer only 5 quections.

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(07). The image shows a small bulb pattern that was mounted in a square shape in the centre of a vesak pandol. The first smallest square has 8 bulbs the 2nd square has 12 bulbs. The bulbs in the next square are 4 more than the previous square.

  i. Write the number of bulbs in the first three squares.

  ii. If the total number of squares in which bulbs are arranged in this way is 15, find the number of bulbs in the 15th square.

  iii. Here the 1st square is in red bulbs and 2nd Square is in blue bulbs.The pattern is repeated accordingly.Show that the diffrence between the red bulbs and the blue bulbs in all the squares is 36.
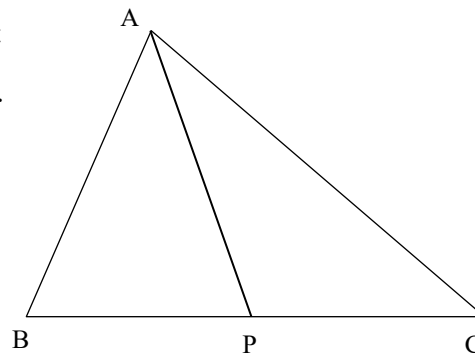

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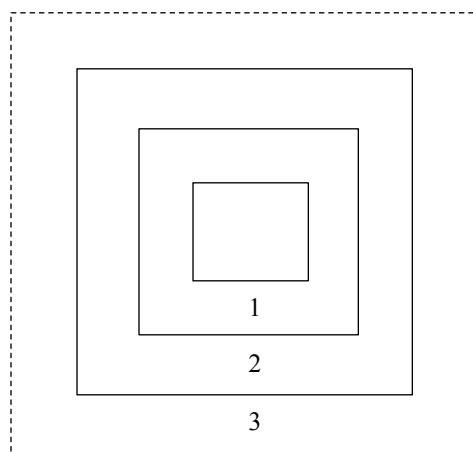
(08) Use only a straight edge with a cm/mm scale and a pair of compasses for the following constructions. Show the construction lines cleary.

  i. Construct on angle $Q\hat{P}R = 60°$ such that, $PQ = 4.2\ cm\ and\ PR = 6cm$.

  ii. Construct a perpendicular at a to PQ and name S the point where it meets extended PR.

  iii. Bisect the side QS and name its midpoint as C.

  iv. Construct the circle whose diameter is QS and measure its radius.

  v. If D is the point where PS meets the circle, give reasons why $P\hat{D}Q$ is a right angle.

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(09) The volume of a water tank of the shape of cuboid with a square bottom of each side x metres and height h metres is equal to the volume of a cylindrical tank of radius r metres and height h metres.

Show that $r = \dfrac{x}{\sqrt{\pi}}$

IF $x = 10.25\ m$ and $\pi = 3.142$ find the value of r to the nearest second decimal place using logarithmic tables.

(10)   P is the midpoint of BC of triangle ABC, such that AB = AP. AB is extended to Q such that AB = BQ. Copy the figure and mark the given information. Answer with reasons.

   i.   Show that $\triangle$ APC $\equiv$ $\triangle$ BPQ.

   ii.   If $A\hat{C}P = B\hat{Q}P$, show that triangle BPQ is an isoseles triangle.

   iii.   Hence show that $\triangle BAP$ is an equilateral triangle.

(11)   The following information was obtained from 45 students of an advanced level class. There were 15 students. Studying art only and 18 students studying economics.
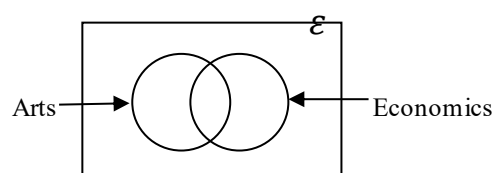
Copy the given venn diagram and based on the given information.

   i.   Find the number who are not studing arts and economics.

   ii.   If the number of students studying only one of these subject is 20. Find the number of students studying both of these subjects.

   iii.   If   A = { Students studying arts}

      E = { Students studying economics}

(අ). Find the value of $n(A \cap E)^{/}$.

(ආ). Shade the region $A^{/} \cap E^{/}$ in the venndiagram .

(12)   In the figure AC is the diameter of a circle with centre O. BD is a chord perpendicular to AC.

  (a).
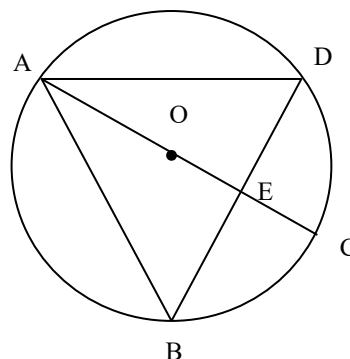
   i.   Copy the figure and connect OB and BC.

   ii.   Find the magmitude of the angle $A\hat{B}C$ and write the Relevent theorem.

  (b) . Prove that,

   i. $A\hat{O}B = 180° - 2C\hat{B}D$

   ii.   AC is a angle bisectorof $B\hat{A}D$.

  (c).

   i.   If the diameter of the cirle is 34 cm and CE = 9 cm, calculate the length of the chord BD.

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