JAFFNA HINDU COLLEGE

First Term Exam - 2023

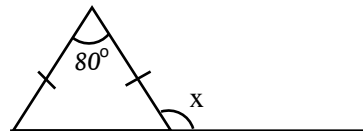| Grade - 11	Mathematics	Time: - 2 Hours

Name/Index No: ……………………………………………

Part I -A

❖ **Answer all questions on this question paper itself.**

01) The values of $\sqrt{69}$ lies between in which whole numbers.

*02)* Find the value of x according to the information in the figure.

03) Factorize $x^2 - 4x^2 - x + 2y$

04) Its take 5 men 4 days to complete $\frac{1}{3}$ of a certain task. Find the number of days required to complete the remaining task for 8 men.
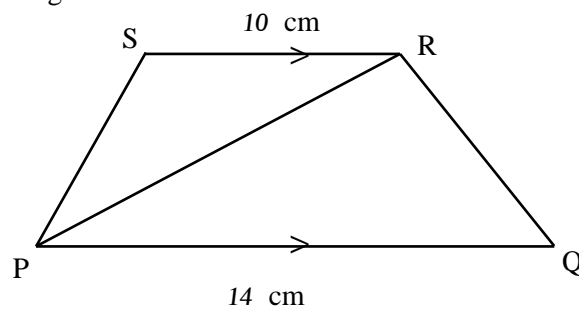
05) A sector with angle at the center 60° is cut off from the circle with radius 21cm. find the area off the sector which is cut off.

06) Find the value of x according to the information in the figure.
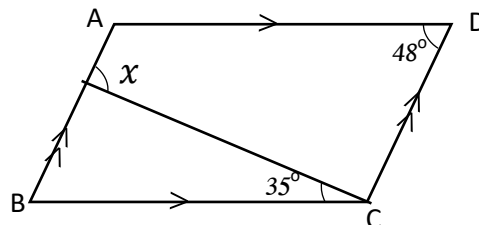
07) Simplify $\frac{12a^2b}{7x} \div \frac{8ab}{21x^2}$

08) If the area of rhombus PQRS is 72cm^2, find the area of triangle PRS.

S ———— 10 cm ————→ R

P →
14 cm
Q

09) Find the least common multiple of $6a^3b$, $8ab^4$ and $4a^5$

10) Find the median of the following data
2, 3, 3, 4, 6, 7, 8, 9, 10

11) Customs duty of 12% is charged when a clock is imported. If the value of the clock is Rs.15000, how much duty has to be paid?
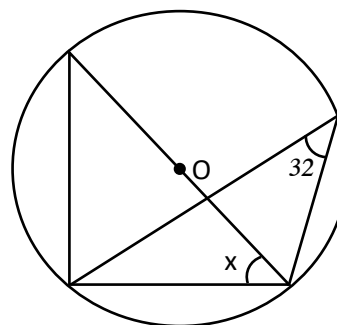
12) A semicircular shaped lamina with center O and radius
3r is shown in the figure A. cone with vertex O is made by
Folding it such that OA and OB join.
   i. Find the slant height of the cone
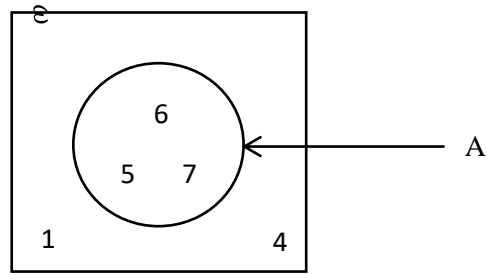
   ii. Find the area of the curved surface in terms of r.

A ←————→ B
3r
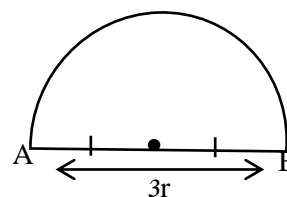
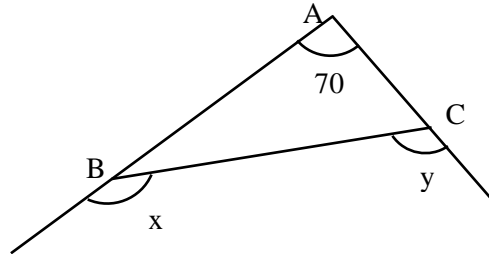13) In the figure, O is center of the circle.
Find the value of x

O

32

x

14) Solve.
$$\frac{4}{3x} - \frac{3}{4x} = \frac{7}{12}$$

15) Find $n(A^1)$

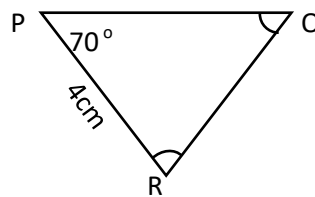16) Find the value of x + y according to the
    Information in the figure

17) Simplify.
$\sqrt{80} \times \sqrt{8}$

18) Find the magnitude of $P\hat{R}Q$, when these two triangles are congruent under the case AAS.
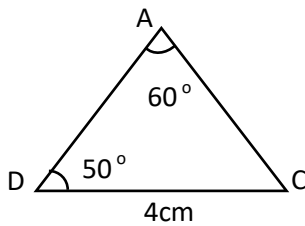
19) Express $10^{0.4771} = 3$ in logarithm form

20) Find the equation of straight-line passes through the point (0,-4) and parallel to $y = 3x + 5$

21) Find the probability of getting a square number when take a card from the box having identical cards numbered from 1 to 10

22) Find the speed of a vehicle which travels 16km distance in 30minutes.

23) AB is chord of a circle with center O and radius 13cm.
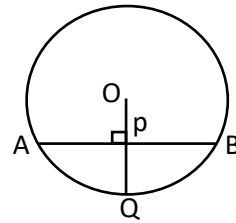Length of AB is 24cm. OP drawn perpendicular to AB.
OP produced meets the circle at Q.
Find the length of PQ.

24) Find the 18th term of the arithmetic progression
7, 12, 17……………..

25) In the given triangle ABC, draw a sketch to find the point P which is equidistance from A, C and on the line AB using the knowledge on loci.
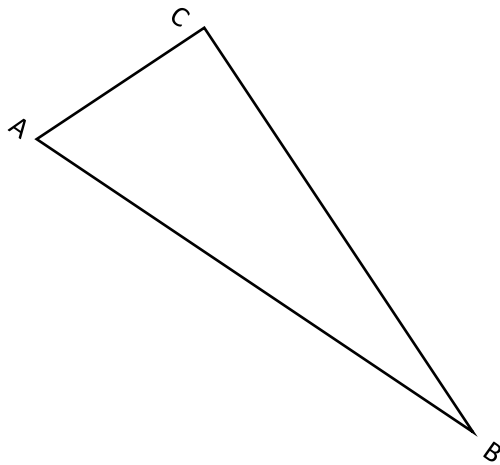
Part – I B

❖ **Answer all questions on this paper itself**

(01) Dilan bought a box of oranges for Rs.600. $\frac{1}{6}$ of the oranges in the box are spoiled and he kept $\frac{2}{5}$ of the unspoiled oranges for his consumption.

    i.   Write the number of unspoiled oranges as a fraction of total number of oranges in the box.

    ii.   Find the number of oranges that he kept for his consumption as a fraction of total number of oranges in the box

    iii.   If he sells the rest of the oranges at Rs.60 per fruit and earns a profit of Rs.600, find the number of oranges he sold?

    iv.   Find the number of oranges in the box initially?

(02)   The board used to cut the fabric for the dress is shown in the figure. It is made by removing two sectors of radius 14cm and angle of the center 120° and 60°.

    i.   Find the total area of the removed parts

    ii.   Find the area of the board

    iii.   A right angled triangular piece of area 120cm^2 With AB as a side is to be joined. Draw a sketch of this triangle with its measurements in the above figure.
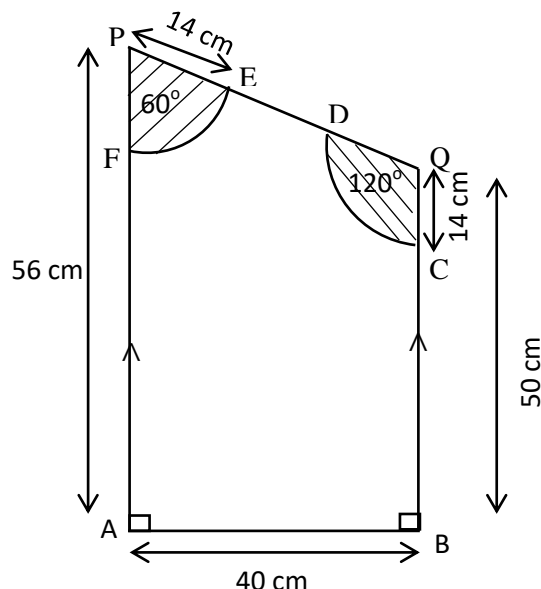
(03) Anushan borrowed Rs.5000 on an agreement to settle the loan in 3 years at 18% annual simple interest.

    i.   Find the total amount to be paid to release from the loan after 3 years.

        At the end of the two years he borrowed another Rs.30000.

    ii.   Find the total amount he should be paid after three years now.

    iii. At the end of the three years Anushan's father gave Rs.12000 to him. Show the money given by his father is enough to pay off loan and interest.

(04)   The Pie chart given below illustrates the types of dresses A,B,C and D were sold in a week in a shop

    i.   Find the magnitude of x
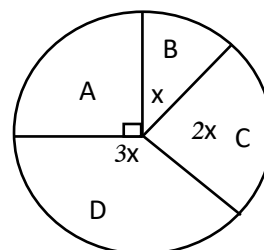
    ii.   Which type of dress sold mostly?

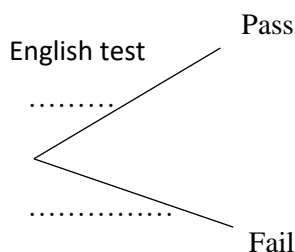   iii. If 1080 dresses sold in this week, find the number of dresses sold in type C

    iv. Find ratio between the number of dresses sold in type B and D

(05)

(a) To get the qualification for a job in the private sector one must pass in the English language test first and then secondly attend for the interview.

The probability of passing the English language test is $\frac{3}{4}$

   i. Incomplete tree diagram relevant to the above information is given below. Indicate the relevant probabilities on it.

```
                          Pass
         English test    /
                        /
              ………    <
                        \
          …………… \
                          Fail
```

   ii. The probability of failing in the interview is $\frac{1}{3}$, extend the tree diagram and indicate the relevant probabilities.

   iii. Find the probability of a person who selected randomly from the persons sat for the English language test. having qualification for this job.

   iv. At the end of the interview declared that100 people are qualified for the job. We can expect, how many people attended in the English language test?

(b) In a box, there are 2 red balls and a yellow ball of the same size and shape. A ball is randomly drawn out and the colour is noted. After replacing it, a ball is randomly drawn out again and its colour is also noted.

   i. Represent the sample space of this random experiment on the given grid.

   ii. Find the probability of both balls being different colours.
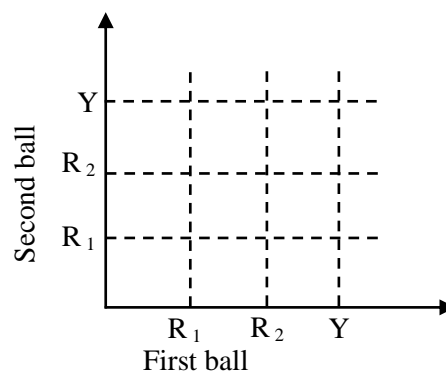
JAFFNA HINDU COLLEGE

First Term Exam - 2023

| Grade - 11 | Mathematics | Time :- 3 Hours |

Name/Index No: …………………………………………

Part II-A

❖ **Answer five questions only**

01) Sathana incurs a cost of Rs.140 in making a fabric bag. She sells it to a vendor at a profit of 30%.

   i.   Find the selling price of a bag

   ii. It 200 bags were sold in a month, find the profit received by Sathana in that month.

   iii. Vendor mark the price of a bag as Rs.250 and sells it to the customer at Rs.225.find the discount percentage given by the vendor.

   iv. Sathana got a loan of Rs.40000 for her business from a company charges 3% simple interest per month. After few months she released from the loan by paying Rs.52000. find the loan period.

02) An incomplete table prepared to draw the function $y = 5 - x^2$ given below

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

  (a)

   i.   Find the value of y when x=0

   ii. By taking 10 small divisions along the x-axis and y-axis as one unit, draw the graph of the function on a graph paper.

  (b) Using the graph that you drawn.

   i.   Write the coordinates of the turning point.

   ii. Write the interval of values of x on which the function is increasing negatively

   iii. Find the roots of the equation $x^2 - 5 = 0$ to the nearest first decimal place

   iv. Write the equation of the graph obtained by translating the above graph downwards by one unit on the coordinate plane without changing the shape of the graph.

03)

  (a) A straight iron rod of length 2.13m is cut into 11 pieces of length x cm and 9 pieces of length y cm to make a decorative grill. If two times of x is 3 less than three times of y.

   i.   Construct a pair of simultaneous equations.

   ii. By solving the equations, find the difference between the x and y.

  (b) Solve

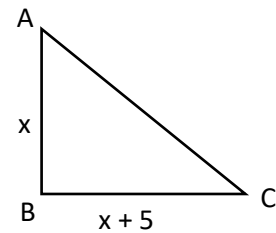$$\frac{3x}{x-2} - \frac{x}{2(x-2)} = \frac{15}{2}$$

04)

(a)

    i.   Expand $(x + 5)^3$

    ii. If $x + \dfrac{1}{x} = 4$, find the value of $x^3 + \dfrac{1}{x^3}$

(b) Area of the given triangle is 150cm^2

    i.   Construct a quadratic equation in terms of x

    ii. By solving the equation find the length of AB and BC

    iii. Find the length of AC

05)

(a) A cat on the top of the wall 60m away from a building observes the bottom of the building with an angle of depression of 25° and the top of the building with an angle of elevation of 30°.

    i.   Draw the scale diagram to the scale 1cm represents 10m

    ii. Find the height of the wall and building using the scale diagram

(b) Find the actual distance represented by 12cm in the scale diagram drawn to the scale 1:50000 in km.

06) The following frequency distribution shows the daily income from a telephone booth reserved for domestic calls during 20 days

Income (Nearest rupees)	100 - 140	140 - 180	180 - 220	220 - 260	260 - 300	300 - 340	340 - 380	380 - 420
Number of days	2	3	3	5	3	2	1	1

    i.   Find the modal class

    ii. Find mean income for a day

    iii. Find the income that can be expected from the phone booth in a month having 30days.

    iv. Find the profit that can be expected from the telephone booth in a year, if Rs.12000 is spent annually on maintain the phone booth and Rs.60000 on labour salaries.

Part II-B

❖ **Answer the five questions only.**

07) pieces are cut from a piece of wire, such that the first piece is 7cm and then each pieces are 4cm more than the previous one.

    i.   Write the lengths of the first four pieces

    ii. What the length of the 8th piece.

    iii. Show that n(2n + 5)cm wire required to cut n number of pieces.

    iv. Find the number of pieces cut, if these pieces of wire are cut from a wire of length 9m.

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

i. Construct the triangle ABC such that AB = 4cm, BC = 7cm and $A\hat{B}C$ = 60'.

ii. Construct a straight line parallel to BC through A

iii. Construct the locus of points moving equal distance from the point A and C

iv. Construct the circle which has its center on the parallel line and which passes through the points A and C.

v. Measure and write down the radius of the circle.

09)
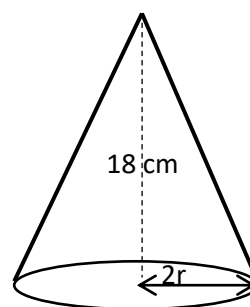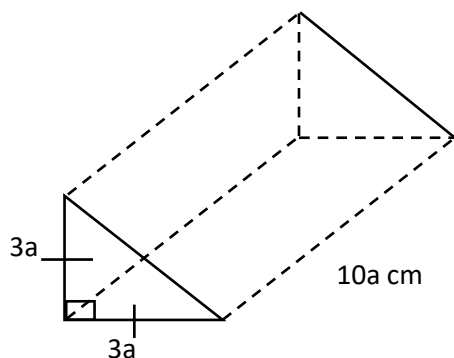
A right circular solid metal cone of base radius 2r and height 18cm is made by melting the solid metal triangular prism in the above figure. Show that $r^3 = \dfrac{15a^3}{8\pi}$, assuming there was no waste of the metal in the molding process. Take $\pi = 3.14$ and find r^2 using logarithms table when a = 3.472 and find the radius of the cone.
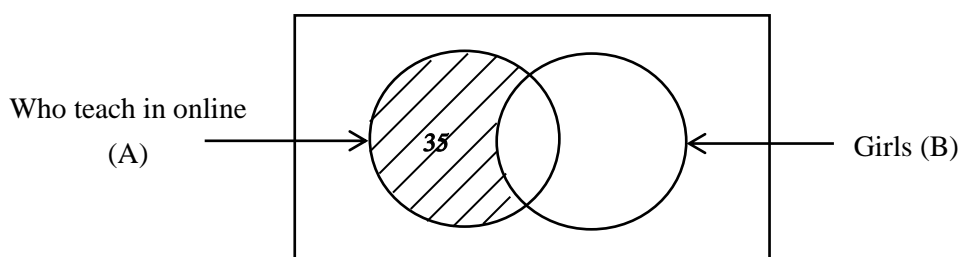
10) In the triangle PQR, X is the midpoint of QR. PQ is produced up to Y. such that PQ=QY, if PQ = PX and $P\hat{R}X = Q\hat{Y}X$,

i. Show that PR = XY
ii. Show that $Q\hat{Y}X = Q\hat{X}Y$
iii. Find the magnitude of $Q\hat{P}X$
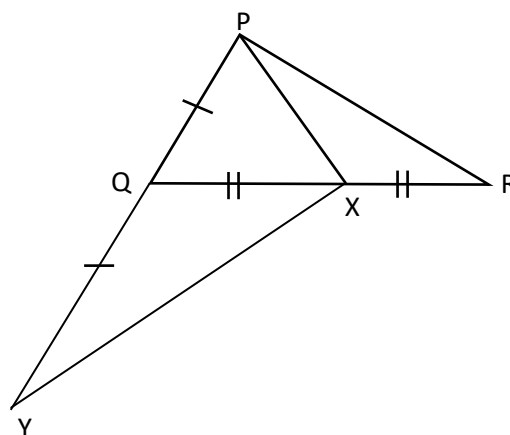
11) The following venn diagram shows the information about the teachers of a certain school.
n(AnB) = 25, n(A^{I}n B) = 20

Who teach in online (A)

Girls (B)

35

i.   Include the above information in the Venn diagram

ii. Describe the shaded region in words

iii. How many men are not teaching in online

iv. Find the probability of a teacher selected randomly among them being a female teacher who teaching in online

12) AB and CD are two chords of a circle which are interest at E. O is the center of the circle

$A\hat{E}C$ is an acute angle.

Show that $A\hat{O}C + B\hat{O}D = 2\,A\hat{E}C$
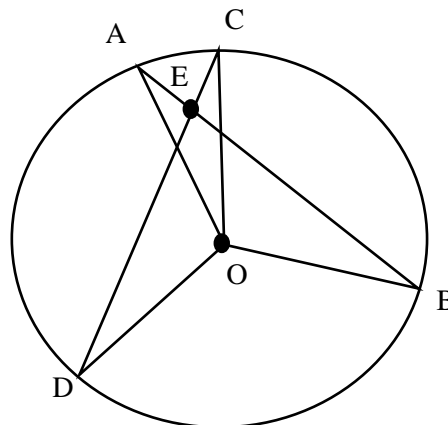
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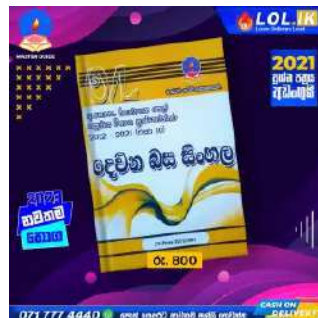
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