



# Jaffna Hindu College

## 1<sup>st</sup> Term Evaluation Exam - 2022

Grade - 11

Mathematics

Time : 3.00 Hours

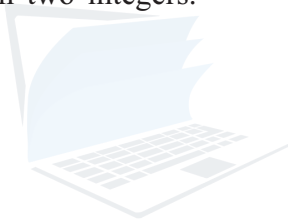
Name / Index No : .....

### Part - I A

❖ Answer all questions on this question paper itself.

01. Find the amount remaining after spent  $\frac{4}{5}$  of Rs.2000

02. Value of  $\sqrt{76}$  lies between in which two integers.



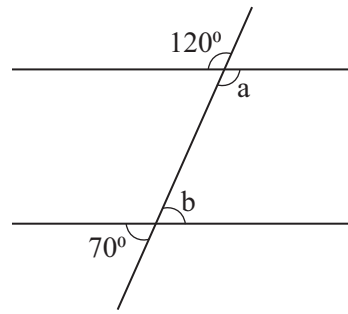
03. If the arc length of a semicircle is 44cm, find the length of its radius.

04. If the perimeter of a square is 1m, find its area in  $\text{cm}^2$

05. Simplify.  $\frac{5}{12} - \frac{1}{12}$

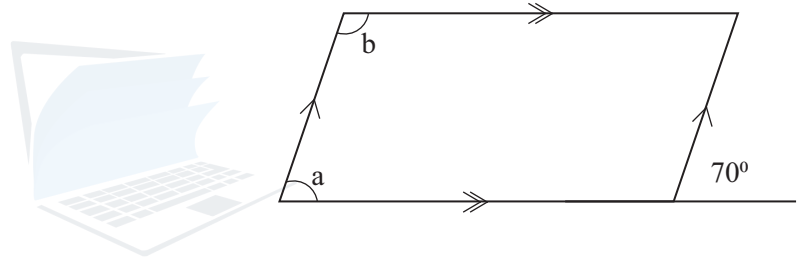
06. Solve  $a - 7 = -2$

07. Find the value of  $a+b$  according to the information in the figure



08. If  $\lg 0.5001 = \bar{1}.6992$ , Find  $\frac{1}{2} \lg 0.5001$

09. Find the magnitudes of  $a$  and  $b$  according to the information in the figure.



10. How many cylinders with base radius 5 cm and height 4 cm can be made by melting an iron cylinder with base 12cm and height 25 cm without wastage.

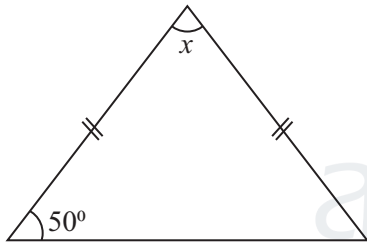
11. By considering the expansion of  $(x-y)^3$ , find the value of  $5^3 - 3 \times 5^2 \times 4 + 3 \times 5 \times 4^2 - 4^3$ .

12. If 20% of profit gained by selling an item for Rs. 3600. Find the purchase price of the item.

13. 5 men can complete a certain task in 6 days. Find how many days required to complete twice the above task for 6 men.

14. Factorize  $2a^2 - 50$

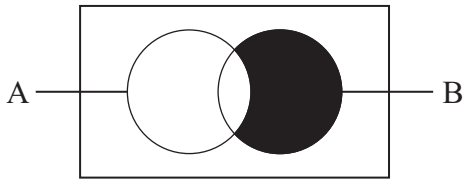
15. According to the information in the figure, Find the value of  $x$ .



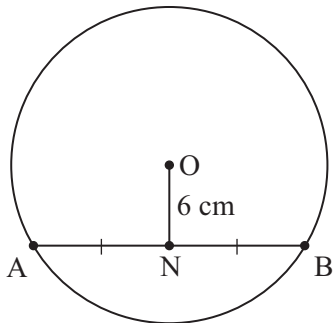
16. Find the coordinates of the point of intersection of straight line  $2y = 4x - 8$  and  $y$  - axis

17. Find the probability of getting 'head' at least once, when tossing a fair coin two times.

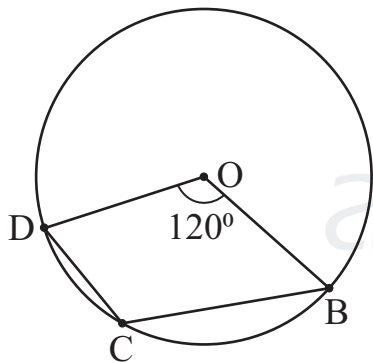
18. Write the shaded region in the venn diagram in set notation.



19. Radius of the circle with center O is 10cm. Find the length of chord AB according to the information in the figure.



20. Find the magnitude of  $\hat{BCD}$  according to the information in the figure (O is the centre of the circle)



21. Find the value of  $x+y$  without finding the value of  $x$  and  $y$  separately.  
 $7x-2y=15$  and  $2x-7y=-5$

22. Mean of the mathematics marks obtained by 10 students is 59. If a student who got 70 marks joined with them, find the new mean.

23. A and B are two light posts. A water tap X has to be constructed equidistance from A and B. By using the knowledge on loci sketch the location of the point X.

A.

.B

24. Distance between the two cities A and B is 36km. Find the time taken to a car travel from A to B with the uniform speed of  $20\text{ms}^{-1}$

25.  $A = \{x / 1 < x < 10, x \text{ is a triangular number}\}$

Write the elements of the set within curly brackets.



### Part - I B

❖ Answer all questions on this question paper itself.

01. a)  $\frac{4}{5}$  of a tank filled with water.  $\frac{3}{4}$  of the water in the tank was used. Give the remaining water in the tank as the fraction of the capacity of tank.

b) Among the tourists visited to Sri Lanka in the first quarter of the year 2021, 30% were Europeans,  $\frac{11}{20}$  were Americans and the rest were Asians.

i) Give the percentage of tourists came from Europe as a simple fraction.

ii) What fraction of the whole tourists is Europeans and Americans?

iii) What fraction of the whole tourists is Asians?

iv) If the number of tourists visited from Asian countries were 17010, Find the total number of tourists visited Sri Lanka in the first quarter of the year 2021.

02. a) Mr. Mugunthan who owns a house assessed to be of annual value Rs 80000, has rented it for a year. The monthly rent charged by Mr. Mugunthan is Rs.5000. The relevant urban council charges 6% of the assessed annual value of the house as rates.

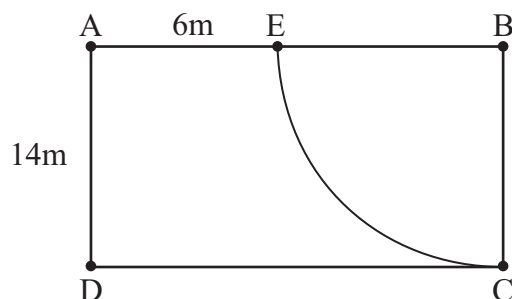
i) Find the amount he receives as the rent for a year.

ii) Find the rates that has to be paid for a quarter.

iii) How much of the rent is left with him after rates was paid?

b) Price of a refrigerator including VAT 16% is Rs 58000. Find the Value of the refrigerator without VAT.

03. In the rectangular shaped land, BCE is a pond. Grass is grown in the remaining portion AECD.



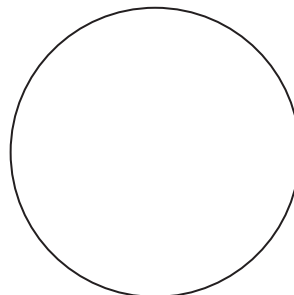
i) Find the perimeter of the land.

- ii) Find the perimeter of the land where grass is grown.
- iii) Find the area of the pond?
- iv) Find the area of the portion where grass is grown.
- v) It is required to add a rectangular plot that is of area equal to the area of the portion where the grass is grown, with AD as a side outside the land. Draw a sketch of this rectangle with its measurements in the above figure.

04. Among the student who sat for the mathematics examination last year,  $\frac{2}{3}$  got "A" pass,  $\frac{1}{12}$  got "B" pass and the rest of the students got "C" and "S" pass. All the students who sat for exam got pass. To represent the above information in a pie chart,

- i) Find the magnitude of central angles of the sectors that represent the students who got "A" pass and "B" pass separately.
- ii) If the central angle of the sector that represents the students who got "C" pass is  $60^\circ$ , Find the central angle of the sector that represent the students who got "S" pass..

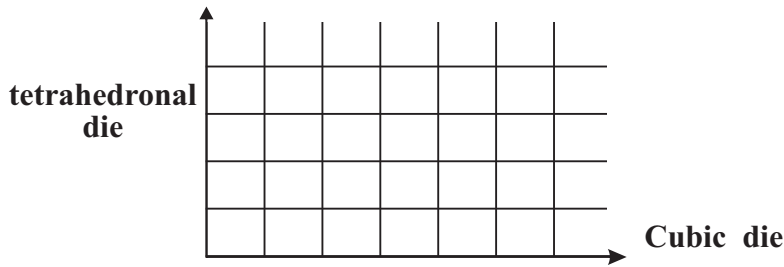
iii) Represent the above informaion in a pie chart?



- iv) If the number of students who got "C" pass is 30. Find the number of students sat for the exam.

05. a) A fair tetrahedral die numbered from 1 to 4 and a fair cubic die numbered 1, 2, 2, 2, 3, 4 are rolled simultaneously and the side on top is recorded in each case. Consider the experiment,

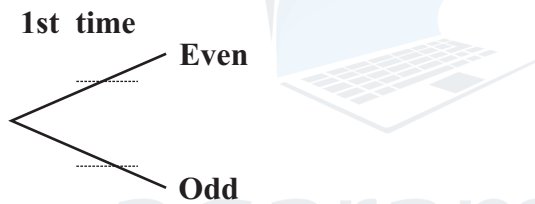
i. Mark the element of the sample space on the given grid with 'X'.



ii. Encircle on the grid, the event of getting prime numbers on the both dice and find its probability.

b) The cubic die given above is rolled two times and side on top is recorded as odd or even.

i. Complete the following tree diagram relevant to the die is rolled first time.



ii. Extend the tree diagram according to the die is rolled second time and indicate the relevant probabilities.

iii. Find the probability of obtaining odd number only once.





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### Part - II A

❖ Answer five question only.

01. An incomplete table of  $y$  values corresponding to several  $x$  values of the quadratic function  $y = x^2 + b$  is given below.

$x$	-3	-2	-1	0	1	2	3
$y$	4	-1	-4	-5	-4	.....	4

- Find the value of  $y$  when  $x=3$  by considering the symmetry of the graph.
  - Find the value of  $b$ .
  - Using the standard system of axes and suitable scale, draw the graph of the given quadratic function on the graph paper, according to the above table.
  - Write the coordinates of turning point of the graph.
  - Write the interval of values of  $x$  on which function is increasing negatively.
  - Deduce the value of  $\sqrt{3}$  from the graph.
02. a) A vendor marked the price of an electric kettle keeping a profit of 20%. When selling the electric kettle, if the payment is done outright, a discount of 10% is offered. If the kettle is sold for outright payment Rs 5400, find the profit earned by vender.
- b) A person takes a loan on annual simple interest, promising to settle the loan in five years by paying Rs 36000. However he was only able to settle the loan in 7 years, at which time he had to pay Rs 38400.
- Calculate the interest he has paid for a year.
  - What was the amount he borrowed?
  - What was the annual simple interest rate that was charged?
03. Information on the time spent by a student to watch television daily is given in the following table.

<b>Time (minutes)</b>	15 - 25	25 - 35	35 - 45	45 - 55	55 - 65	65 - 75	75 - 85
<b>Number of days</b>	2	4	11	5	4	3	1

- What is the modal class of this distribution.
- Find the mean time of this distribution spent by the student to watch television in a day.
- Find the time spent by the student to watch television in a month.
- If he spent extra one hour at the weekends, show that he spent more than 30 hours to watch television in a month.

04. a) Solve.

$$\frac{2a+1}{2} - \frac{a-2}{3} = 2$$

b) The length of a wooden plank is 4m more than its breadth. Area of the wooden plank is  $480\text{m}^2$ . By taking the breadth of the wooden plank as  $x$  meter, construct a quadratic equation in terms of  $x$ . By solving the quadratic equation find the length and breadth of the wooden plank.

05. a) Akshayan has two rupee and five rupee coins, which total Rs 50. Number of five rupee coins is 3 more than the number of two rupee coins.

i. Taking the number of five rupee coins as  $x$  and the number of two rupee coins as  $y$ , construct a pair of simultaneous equations.

ii. By solving the above equations, find separately the number of five rupee coins and two rupee coins he has.

iii. Find the total amount of money, if he got ten rupee notes as twice the number of five rupee coins.

b) Solve  $2x - 1 \leq 11$ .

06. a) In a scale diagram drawn to the scale 1:40000,

i. Find the actual length represented by 5 cm?

ii. By what length is an actual length of 3.2 km represented?

b) An observer who stands on a horizontal ground certain distance away from a vertical building, observes the top of the building with an angle of elevation of  $35^\circ$ . He moves 30 m towards the building and observes the top of the same building with an angle of elevation  $50^\circ$ .

i. Draw the scale diagram depicting the above information to the scale 1:1000.

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

## Part - II B

❖ Answer all questions on this question paper itself.

07. A computer course for 39600

Abinayan needed to save the money to study the above course. For that he joined with his father's business and saved Rs. 500 in January. He saved each month Rs. 200 more than the previous month.

- i. Write separately, the amounts he saved in the first three months.
- ii. How much money he saved in the month of September.
- iii. Find the total amount he saved at the end of the December.
- iv. His brother says that 'He can not reach his aim even he spent an extra year by saving like this. By finding the number of months taken to save the money to study this course, show that his brother's statement is incorrect.

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

- i. Construct the triangle ABC such that  $BC = 8\text{cm}$ ,  $\angle C = 60^\circ$  and  $AB = 4\text{cm}$ .
- ii. Construct a straight line through A parallel to BC.
- iii. Construct the locus of point moving equidistant from A and C.
- iv. Mark the intersecting point of parallel line and locus drawn in (iii) as X. Construct the circle with center X and radius XA.
- v. Measure and write down the length of radius.

09. Radius of a right circular solid cylinder is  $2r$  and its height is three times the radius.

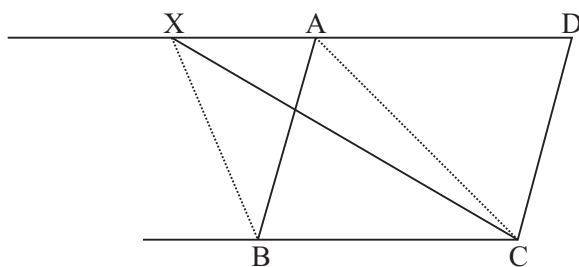
- i. Find the height in terms of  $r$ .
- ii. A solid right circular cone of radius  $r$  is made by melting this cylinder. Show that the height of the cone is  $72$  times its radius. (There was no waste of the metal in the molding process).

iii. If the volume of cone is  $V$ , show that  $r = \sqrt[3]{\frac{V}{24\pi}}$

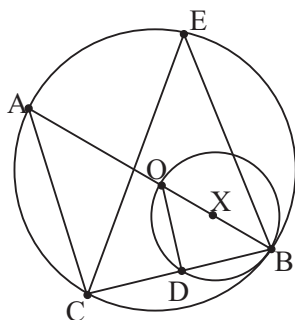
iv. If the volume of cone is  $650$  cubic units and  $12\pi = 37.1$ , Find the radius of the cone using the logarithms table.

10. a) Prove the theorem, "Parallelograms on the same base and between the same pair of parallel lines are equal in area".

b) In the parallelogram ABCD, the side DA produced to X show that the area of triangle DCX is equal to the area of quadrilateral BCAX.

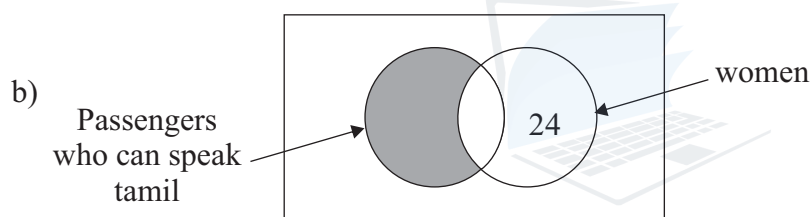


11. AB is a straight line. Centre of the small circle and the larger circle are X and O respectively. A, B, C and E are the points on the larger circle.



- i. Find the magnitude of  $\hat{ACB}$ .
- ii. Show that  $AC \parallel OD$
- iii. Show that  $\triangle OBD \equiv \triangle OCD$
- iv. If  $\hat{ABC} = x$ , Find the magnitude of  $\hat{CEB}$  in terms of  $x$ .

12. a) A and B are two events. If  $n(A \cup B) = 80$ ,  $n(A^1) = 45$ ,  $n(B) = 60$  and  $n(\epsilon) = 100$ , find  $n(A \cap B)$ .



An incomplete Venn diagram draw to represent the information collected from the 60 passengers who traveled in a bus. Some passengers can speak only sinhala 26 passengers can speak only tamil. 36 passengers were women.

- i) Copy the incomplete Venn diagram given in the figure onto your answer script and include above given information in it.
- ii) Find the number of women who can speak sinhala.
- iii) Describe the shaded region in the venn diagram.
- iv) Find the number of men who can speak only sinhala.
- v) Find the number of men who traveled in the bus.