

SOUTHERN PROVINCIAL DEPARTMENT OF EDUCATION

MID YEAR TEST - 2019

GRADE - 11

MATHEMATICS - I

Name/ Index No :-

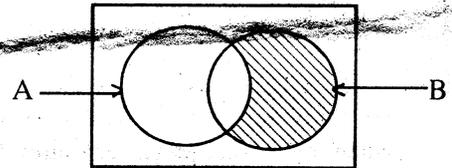
Time : 2 Hours

- Answer all the questions in the paper itself.
(2 marks are given for each correct answer for the questions from 1- 25)

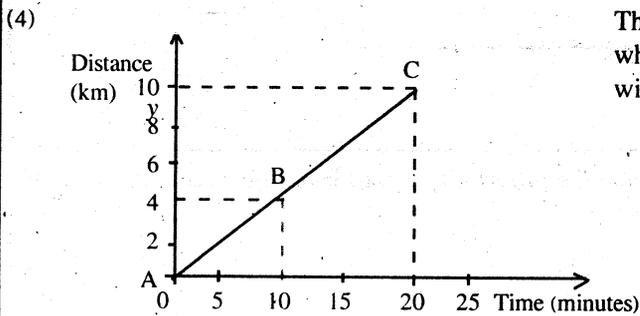
Part A

(1) A 15% customs duty is charged for an imported item worth Rs 50,000. Find the amount that has to be paid as customs duty.

(2) Describe the shaded region in words.



(3) Separate $x^2 - 3x - 18$ into factors.



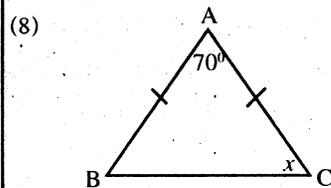
This distance - time graph represent the motion of a person who travelled by a bicycle. Find the speed of that person within the last 10 minutes in Kilometers per hour.

(5) Select the first approximation of $\sqrt{33}$ from the given answers and underline.

- (1) 5.5 (ii) 5.6 (iii) 5.7 (iv) 5.8 (v) 5.9

(6) Simplify. $\frac{1}{2x} - \frac{3}{8x}$

(7) Write down $\lg 20 = 1.301$ in index notation.



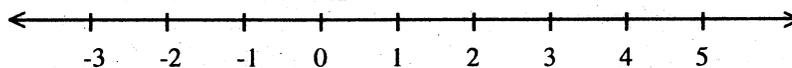
In the triangle ABC, $AB = AC$ If $\hat{BAC} = 70^\circ$

Find the value of \hat{ACB}

(9) The radius of a solid cylinder is 7cm. Its curved surface area is 880cm^2 . Find the height of the cylinder.

(10) Mr. Ranil bought 5000 shares in a company at the market price of Rs. 20 per share. He sold all the shares when the market price per share was Rs. 30. Find the capital gain he received.

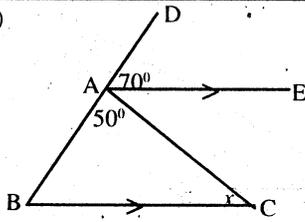
(11) Represent the integral solutions of the inequality $x - 1 \leq 2$ on the number line.



(12) In a box there are cards numbered from 1 to 10. Find the probability a card taken out randomly from the box is a multiple of 2 or a multiple of 5.

(13) Find the LCM of these algebraic expressions. $4x^2$, $6x^2y$, $2y^2$

(14)



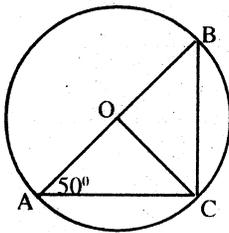
Using the given data find the value of x .

(15)

The graph which is given by the equation $y = 3x + C$ is passes through $(0, 5)$ point. Find the gradient and the intercept of the graph.

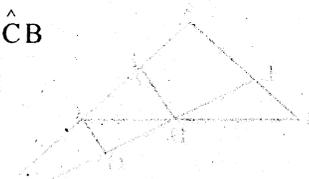


(16)



In the given circle O is the centre and AB is a diameter.

If $\angle OAC = 50^\circ$. Find the value of $\angle OCB$



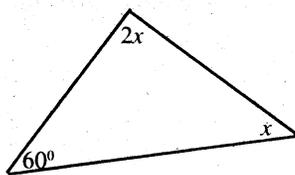
(17)

Capacity of a tank is $5m^3$. Half of the tank filled with water. If water flows out from a pump at a rate of $5l$ per second, find the time taken to empty the tank completely.

(18)

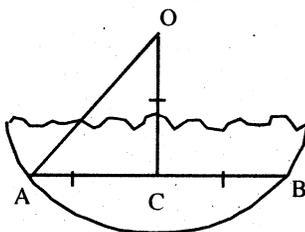
Simplify $\frac{3x}{4y} \div \frac{9}{8y}$.

(19)



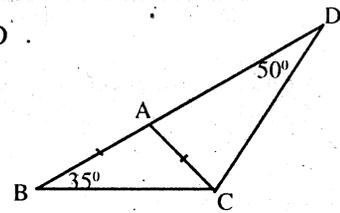
Using the given data in the figure find the value of x .

(20)

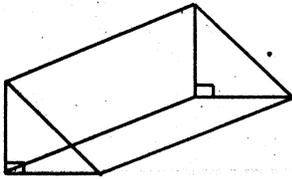


This figure shows a part of a circular lamina. O is the centre of the circle. What is the magnitude of $\angle AOC$.

(21) In this figure BAD is a straight line. Find the magnitude of \hat{ACD} .

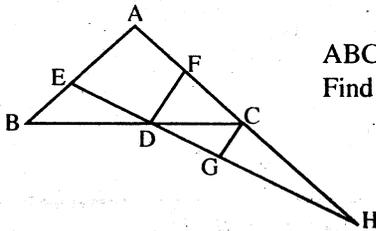


(22)



This figure represent a prism. The length of the two sides which includes the right angle is a and b . The height (length) of the prism is c . Draw two different faces of the prism with the measurements.

(23)



ABC is a triangle. $AB = 8\text{cm}$ & $AF = FC = CH$ and $AB \parallel FD \parallel CG$. Find the length of the side CG.

(24) The below table represent an information collected from 19 houses about the usage of water units. Using the data given in the table,

Number of Water units	4	5	6	7
Number of houses	6	9	3	1

(i) Find the first quartile.

(ii) Find the third quartile.

(25) Mark the point C on this which is moving equidistant from A and B points and 4cm away from the line AB.



(1) (a) Simplify $\left(\frac{1}{3} + \frac{7}{12}\right) \div 1\frac{3}{4}$.

(b) Anura and Chathura are engaged in selling vegetables. They bought beans and divide equally among them. $\frac{1}{5}$ of the amount which Anura received are rotten. He sold the remaining beans at the price of Rs. 100 per 1 kg. He earned Rs. 4000 from it.

(i) Which fraction of the total amount Anura sold?

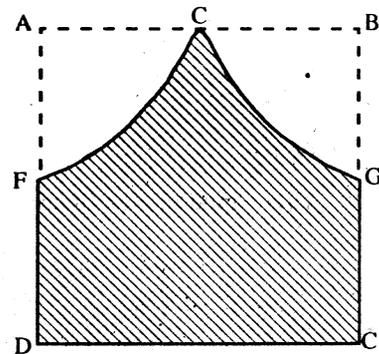
(ii) Find the mass of beans he sold in kg.

(iii) Find the total mass of beans bought by Anura and Chathura.

(iv) Chathura sold all the beans he had and received the same amount received by Anura. Find the selling price of 1kg of beans sold by Chathura.

- (2) (a) (i) The Urban Council charges 6% of the value of the house as rates. If the assessed annual value of a house is Rs. 50000 calculate the rates that have to be paid for a quarter.
- (ii) This year the assessed annual value of the house increased to Rs. 60000 and the rates charged for a quarter is Rs. 825. Calculate the deducted rates percentage that the Urban Council charged as rates.
- (iii) The electricity bill in last month of Dayanthas' house is Rs. 2310. VAT of 10% is added to that bill. Find the value of the electricity bill without VAT.

- (3) This shaded region represent a fabric which is remain after removing 2 sectors from a square shaped fabric. A and B are the centres of the sectors. Mid points of AB, BC and AD are E, G and F respectively..



- (i) Find the area of a sector which is removed.
- (ii) Find the area of this fabric.
- (iii) Find the length of the lace which is need to paste around this fabric.

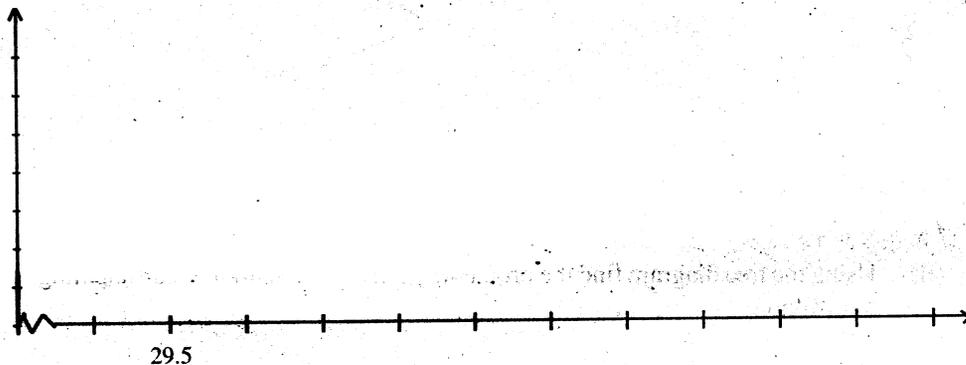
- (4) The below table represent an information about the usage of electricity of 100 houses in a village during January 2019.

Class interval (electricity units)	30 - 39	40 - 49	50 - 59	60 - 69	70 - 89	90 - 119
Frequency (Number of houses)	10	20	35	16	10	9

- (i) Complete the below table, Using the above table.

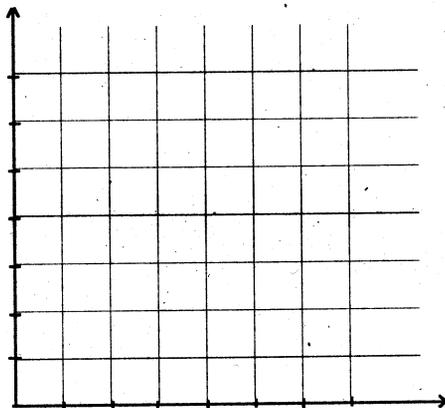
Class intervals with boundaries	29.5 - 39.5					89.5 - 119.5
Frequency	10					9

- (ii) Represent the information in the table with class boundries in a histogram.



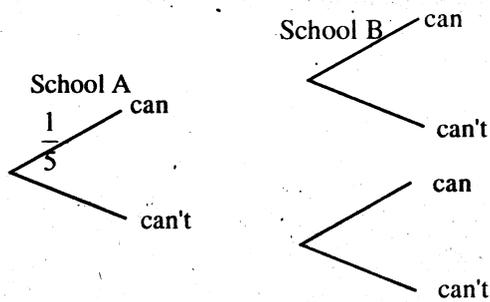
- (iii) Draw the frequency polygon using the histogram.

- (5) (a) There is an educational exhibition in a school located in an Urban area from Monday to Friday. Two schools named A and B which are located in a rural area decides to come for that exhibition.
- (i) Represent the sample space in the grid using "x" of the event that the two schools selecting a date to come for the exhibition.



- (ii) Enclose the event "Students of school B participate for the exhibition on a day before the students in school A". Find the probability.

- (b) (i) The probability of participating school "A" on Monday is $\frac{1}{5}$ and participating school B on Monday is $\frac{1}{5}$ complete the below tree diagram.



- (ii) Using the tree diagram find the probability atleast one school is participating for the exhibition on Monday.

SOUTHERN PROVINCIAL DEPARTMENT OF EDUCATION

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MATHEMATICS - II

Name/ Index No :-

Time : 03 Hours

- Answer 10 questions by selecting 05 questions from part A and 5 questions from part B.

Part A

Answer only 05 questions.

- (1) An incomplete table prepared to sketch the graph of the function $y = x^2 - 2x - 4$ is given below.

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

- (a) (i) Find the value y when $x = 1$.
 (ii) Using the scale of 10 small divisions as one unit along both the x axis and y axis sketch the graph of the above function.
 (iii) Write the interval of the values of x which y is increasing negatively.
- (b) Using the graph
 (i) Write down the equation of the graph of the form $y = (x + a)^2 + b$.
 (ii) Using the graph find the value of $\sqrt{5}$.
 (iii) Find the maximum value of the graph which is represented by $y = 4 + 2x - x^2$.

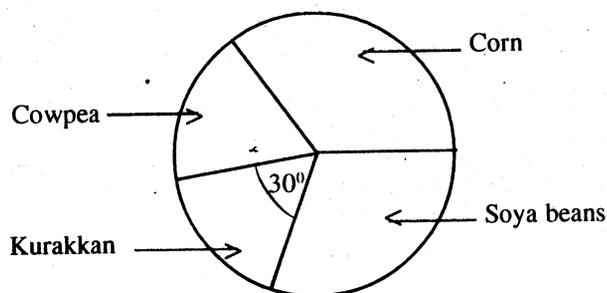
- (2) A set of information about the electricity consumption of 80 houses in a certain village is given by the below frequency distribution.

Electricity units	11 - 30	31 - 50	51 - 70	71 - 90	91 - 110	111 - 130
No. of houses (frequency)	5	18	35	14	6	2

- (i) What is the modal class of this distribution?
 (ii) By taking the mid value of the modal class as assumed mean or any other method find the mean of the monthly electricity units used by a house.
 (iii) Electricity facility is given to 20 new houses in this village. These houses also use electricity as in the above houses. An electricity company said that if the total units consume by the village during a month is exceed 6000 units it is essential to use a new transformer. Show that the statement of that company is true.

- (3) A television priced at Rs. 54000 for outright purchase can be bought by making a down payment of Rs. 6000 and paying the rest in 16 equal monthly installments of Rs.3170. If the interest is calculated on the reducing balance find the annual interest rate.

- (4) (a) The below pie chart represent an information about the way how 4 types of grains are cultivated in a land of a certain area.



- (i) If the cowpea cultivated area is twice as the kurakkan cultivated area what is the angle of the sector which represent cowpea.
- (ii) If the area of corn cultivated area and soya beans cultivated area is equal find the angle of the sector which represent corn.
- (iii) If the cowpea cultivated area is 5400m^2 then find the area of the land which cultivated soya beans.
- (b) Food is sufficient for 50 people in a camp who are affected by flood for 2 weeks. However, two days after 10 of them went to their houses. For how many days the remaining food is sufficient for the others.

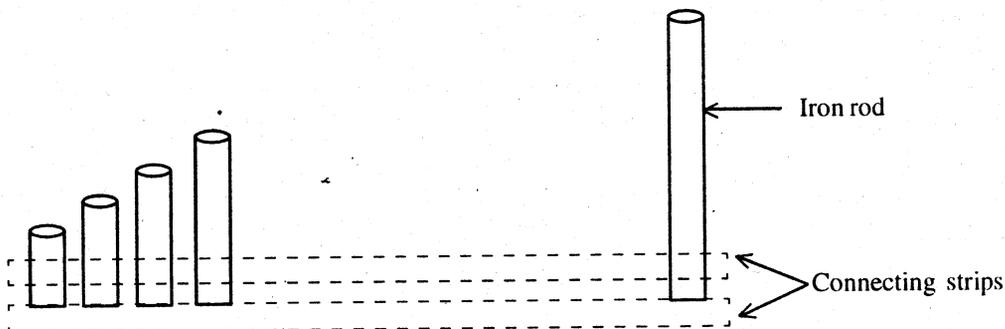
- (5) (a) The length of the parallel sides of a trapezium are x cm and $(x + 8)$ cm. The perpendicular distance between the parallel sides is x cm. If the area of the trapezium is 16cm^2 show that it fulfills the quadratic equation $x^2 + 4x - 16 = 0$ and find the lengths of the parallel sides. ($\sqrt{5} = 2.23$)

- (6) (a) The price of 6 apples and 5 oranges is Rs.392. Price of an orange is Rs. 8 more than the price of an apple.
- (i) By taking the price of an apple as Rs. x and price of an orange as Rs. y build up a pair of simultaneous equations and by solving it, find the price of an apple and an orange.
- (ii) If the number of apples can be using a certain amount of money is two more than the number of oranges Find that amount.
- (b) Separate in to factors. $2a^3 - 8a$

Part B

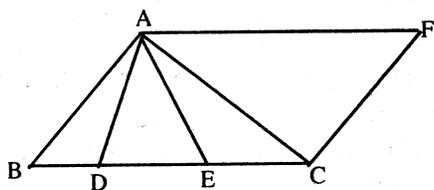
Write down the answers for only 5 questions.

- (7) A part of a musical instrument which is made by Mr. Gayan using iron rods is given below. Length of the 1st iron rod is 4cm and the length of the last rod is 24cm. The difference of the length between two consecutive iron rods is 2cm.



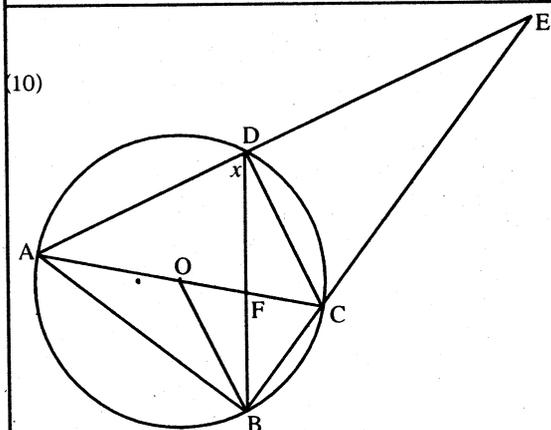
Using the knowledge of arithmetic progression and its formulae,

- (i) Find the number of iron rods which is needed to make the instrument.
 - (ii) Find the total length of the iron rods.
 - (iii) Another instrument is made by keeping the length of rods and number of rods same but the difference between two consecutive rods is now 3cm. Find the extra length of rods which is needed to make that instrument.
- (8) For the below constructions use the pair of compasses and cm / mm ruler.
- (i) Construct the triangle ABC such that $AB = 3.5\text{cm}$, $BC = 5\text{cm}$ and $\hat{A}BC = 90^\circ$.
 - (ii) Mark the point D on the parallel line through A which is parallel to BC such that $AC = BD$.
 - (iii) Mark the point E on the extended AD line such that DBCE is a parallelogram.
 - (iv) By giving reasons write down the suitable name for the ABCD quadrilateral.



In the diagram $AB = AC$, $AD = AE$, $AC = CF$ and $BC \parallel AF$

- (9)
- (i) Show that $\triangle ABD \cong \triangle AEC$.
 - (ii) Show that ABCF is a parallelogram.



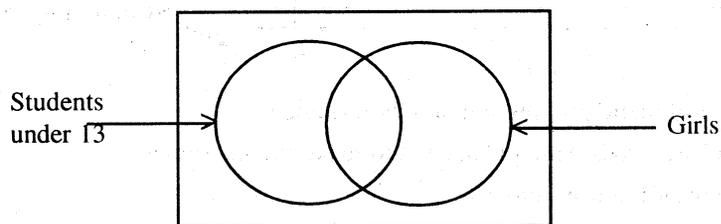
- (10)
- O is the centre and AC is a diameter of the circle.
 $DE = DB$ and $\hat{A}DB = x$. By giving reasons,
- (i) Write the value of $\hat{A}OB$ in terms of x .
 - (ii) What is the value of $\hat{A}DC$?
 - (iii) Write the value of $\hat{D}BE$ in terms of x .
 - (iv) Show that $\triangle ADC \cong \triangle CDE$.

- (11) 28 prisms with isosceles right angled cross section is made by melting a solid cylinder of base radius r and height 12cm. The length of a side which includes the right angle is 6cm and height is 6cm, Show that the value of r is given by $r = 6 \sqrt{\frac{7}{\pi}}$ then by taking $\pi = 3.14$ and using the logarithm tables find the value of r to the nearest whole number.

- (12) Girls and boys are participate for a practice academy for under 13 and under 15 cricket teams in a certain mixed school.

35 girls selected for the academy and 18 out of them for under 13 team. Total number of students selected for under 13 team is 40. 17 boys selected for under 15 team.

- (i) Represent the above data in the below venn diagram.



- (ii) Find the total number of students selected to this practice academy.
(iii) When the registration of the teams are done 3 girls of under 15 team and 3 boys of under 15 team left the academy. Due to this 2 girls from under 13 team and 2 boys from under 13 team join to the under 15 team. Represent this new data in a new venn diagram.