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மாகாணக் கல்விப் திணைக்களம் - வட மத்திய மாகாணம்
DEPARTMENT OF EDUCATION – NORTH CENTRAL PROVINCE

Grade 11

Third Term Test - 2022

Subject :- **Mathematics I**

School Name : .....

Index Number : .....

Time : **2 hrs**

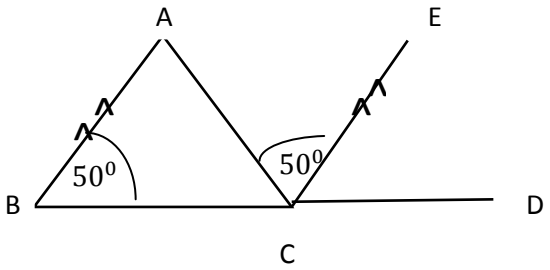
Part A

Answer all the questions in this paper itself.

1) The assessed annual value of a house in a certain provincial domain is Rs.24 000 and 8% is charged as the rate. Find the annual rate that should be paid for this house.

2) Solve $\frac{x+5}{3} = 10$

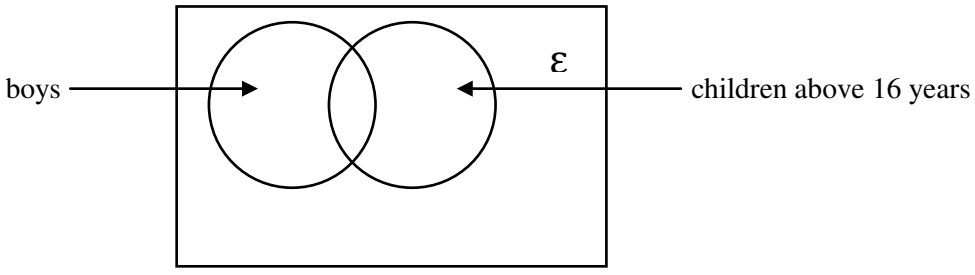
3) Name the two equal sides of the ΔABC according to the given information.



4) Select the value of the first approximation of $\sqrt{18}$ and underline it.

i) 4.1 ii) 4.2 iii) 4.3 iv) 4.4

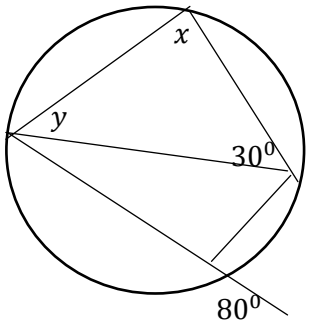
5) The data of the members in a sports club is given in the Venn diagram. Shade the region regarding the girls above 16 years in the Venn diagram



6) Write x^2+11 x +24 as a product of two factors.

7) Find the duration that fills the tank of the capacity 24 000 l using a pipe through which water flows at a uniform rate of 40l per minute.

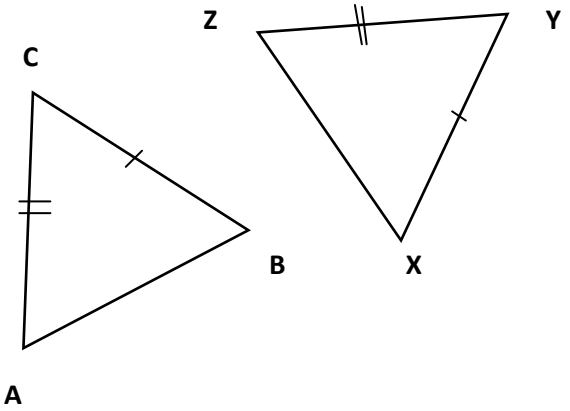
8) According to the given information in the figure, find x and y .



9) Find the gradient of the straight line which goes through the points (0,4) and (2,10)

10) When tossing a coin along with a dice, which is numbered from 1 to 6 in an experiment, find the probability of getting head of the coin and number 4 in the dice.

11) To prove given pairs of triangles congruent, which remaining pair of corresponding elements should be equal to each other?



i. ACB = XZY

ii. ACB = XYZ

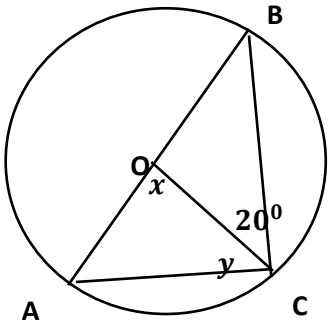
iii. AB = XZ

iv. BAC = XYZ

12) If the first term is 3, the common ratio is 5 of a Geometric progression. Find the 5th term (write the answer using index form)

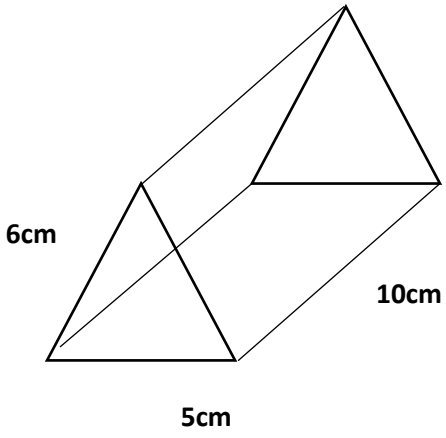
13) Write the set of positive integers that satisfy the inequality $2x$ - 3 ≤1

14) The centre of the circle is O. Find the magnitudes of the angles x and y



15) Simplify $\frac{1}{x} + \frac{3}{5x}$

16) According to the given prism, draw two different surfaces with measurements

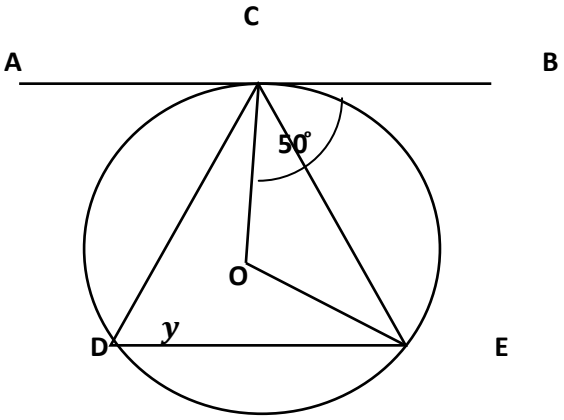


17) A part of a frequency distribution written in ascending order is given below.

2 , 3, 5, 6, 7, 8

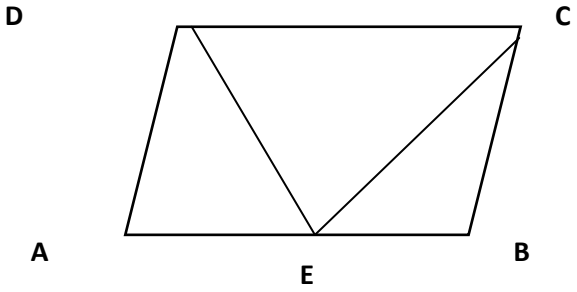
If the median of this distribution is 8, then find the total number of data.

18) AB is a tangent of the circle with the centre is O. Find the magnitudes of the angles x and y



19) Find the L.C.M. of $9x2y$,$6xy2$

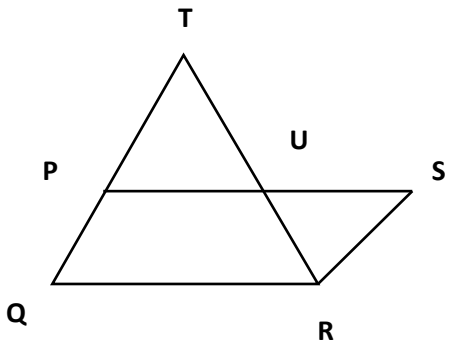
20) If the area of the ΔDCE is $35cm2$, find the area of the parallelogram ABCD.



21) . A cylindrical tank of the base area is 154 m² is filled up to 10m height. Find the volume of water in the tank

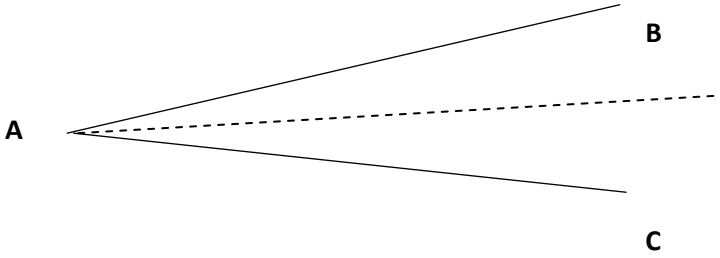
22) Sathis is a businessman whose annual income is RS.700 000. How much he should pay as the annual income tax? (Tax for initial Rs.500 000 of annual income is free, the tax for next Rs. 500 000 is 4% and next Rs.500 000 is 8%).

23) The mid points of TQ and RT are P and U respectively in the ΔQRT. If PU=4cm and QT=6cm, find the perimeter of the parallelogram PQRS.



24) 8 men spend 9 days to complete a certain task. Find the number of days to complete half of the task by 3 men

25) AB and AC are the boundaries in two lands. According to the figure, a lamp post should be fixed such that equidistance from AB and AC and equidistance from the points A and C as well. Using the knowledge of Loci, sketch the location of the lamp post.



Part B

Answer all the question in this paper itself

1) From a vegetable stock transported for sale , 14 of stock was brinjal, 16 of it was bitter gourd, 37 of the remaining was long beans and the remaining was pumpkin.

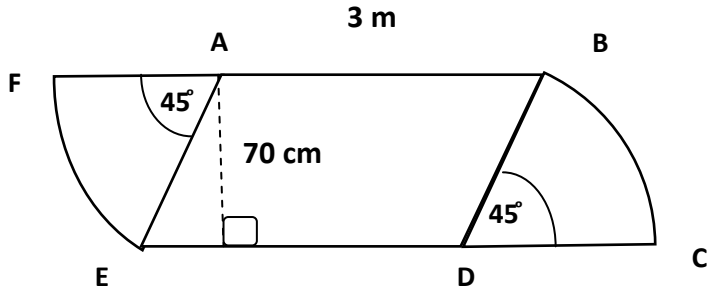
I. What is the fraction of total of brinjal and bitter gourd? (2marks)

II. What is the fraction of total stock is long beans? (2marks)

III. The difference of mass between long beans and brinjal was 30kg in the vegetable stock. Find the total mass of the vegetable stock. (3marks)

IV. If the price of 1kg of pumpkin is Rs.120, find the total income gained by selling pumpkin. (3marks)

2) A frame prepared to be fixed horizontally above a pandol is shown bellow. It consists of a parallelogram ABCD, two sectors of circles AEF and BCD.



I. If the length of EC is 384cm, find the radius of the sector of the circle. (2 marks)

II. Find the arc length FE. (1mark)

III. Stars should be pasted at 6cm by 6cm along the curved lines FE and BC. Find the total number of stars that need to paste. (3marks)

IV. If the cost for metal to make this part of the pandol is RS.79632, find the cost for 1cm2 of the metal. (4marks)

3) Mr.Mohomod imports a printing machine worth of Rs.500 000. 30% and a tax is charged as the custom duty when it is imported.

I. Find the custom duty. (2marks)

II. Find the total worth of the machine after paying the custom duty. (1mark)

When unload and transport the printer, he had to spent extra Rs.50 000 and take a loan at annual simple interest rate of 15% to cover all these expenses.

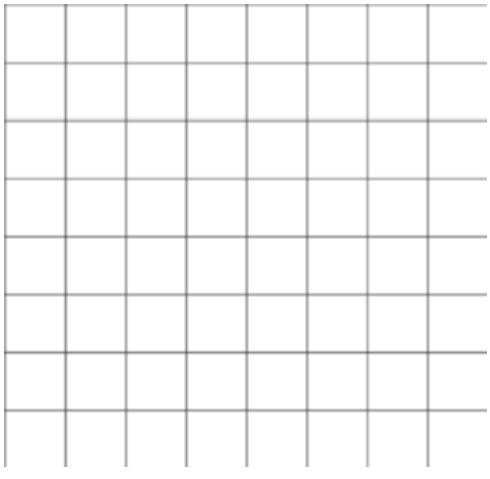
III. How much loan did he have to take? (1mark)

IV. He paid this loan amount and the interest after two years. Find the total amount that he should pay to release from the loan. (4marks)

V. If he could pay the total amount from the profit that gain from the machine after two years. Find the profit that would gain from it. (2marks)

4) a) A card is taken out randomly from a box that include identical cards numbered from 1 to 7, its number was recorded and returned to the box.

I. Mark the sample space regarding the above experiment on the given Cartesian plane using '×' (3marks)



II. Find the probability that the sum of the numbers on two cards that taken out randomly is greater than 11. (2 marks)

b) There are 3 red beads, 7 blue beads in the box A. There are 2 red beads and a blue bead in the box B.

I. Complete the tree diagram to show that a bead is taken randomly from box A (1mark)

Taken from box A red

.....

blue

.....

III. A bead which was taken from box A is put in to the box B and a bead is taken out randomly from the box B. Extend the above tree diagram to represent this event. (2marks)

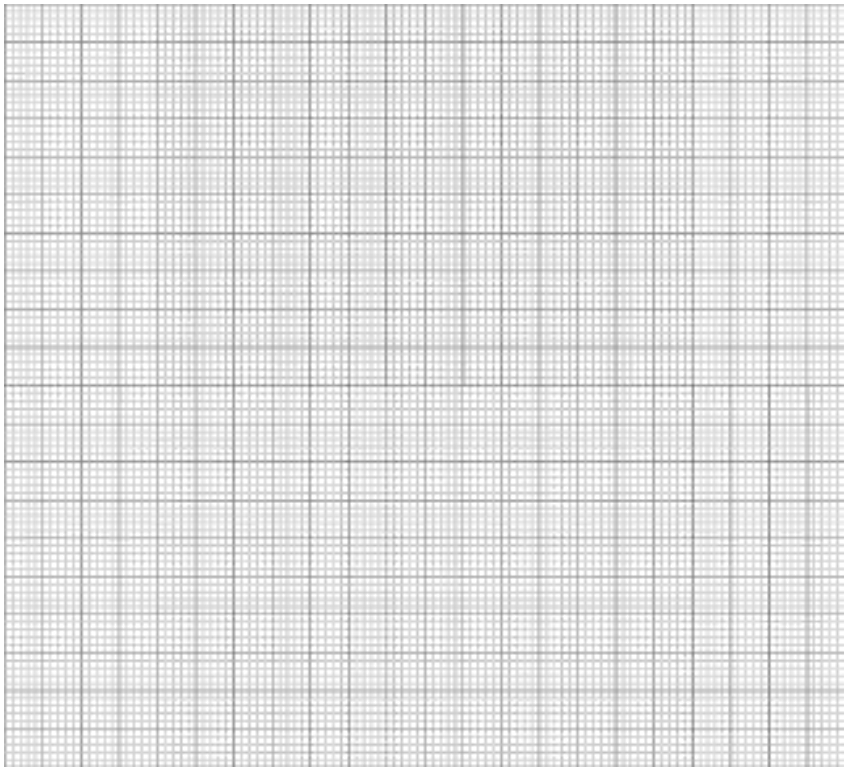
IV. Find the probability of both beads that taken out being same colors. (2marks)

5) Below is an incomplete table of the time spent in answering the grid work sheet by 90 students of a certain grade in a school implementing the GSM project.

The time spent (seconds)	number of students (frequency)	Cumulative frequency
0 - 20	11	.....
20 - 40	24	.....
40 - 60	.....	61
60 - 80	17	.....
80 - 100	.....	.....

I. Fill in the blanks in the table. (3marks)

II. Using the above table, draw the Cumulative frequency curve. (3marks)



III. Find the median time that is recorded by a student using the cumulative frequency curve. (2marks)

IV. A gift will be given to the students who spent the time less than 70 seconds. How many students will get the gifts? (2marks)

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மாகாணக் கல்வித் திணைக்களம் - வட மத்திய மாகாணம்
DEPARTMENT OF EDUCATION – NORTH CENTRAL PROVINCE

Third Term Test - 2022

Grade 11

Subject :- Mathematics - II

School Name : .....

Index Number : .....

Time : 3 hrs 10 m

- Time for additional reading 10 minutes.
- Use the extra time to read the question paper and choose the questions and organize the questions that are give3n priority in answering.
- Answer 10 questions selecting five questions from part A and five questions from part B.
- When answering the questions write down the relevant steps and the correct units.
- Each question caries 10 marks. The volume of a right circular cylinder of base radius r and height h is $\pi r^2 h$.

Part A

- **Answer five questions only**

1) Asiri borrowed Rs.120 000 under the reducing balance method at an annual interest rate of 18% and agreed to repay the loan amount in 12 monthly instalments. Then he lends the loan amount to another person at a simple interest expecting twice the amount of interest he has to pay for the above loan amount. At the end of the year, if his target was fulfilled, find the annual simple interest rate he would have charged from the person.

2) An incomplete table is given below to draw the graph for the function$x$

	-1	0	1	2	3	4	5
	6	1	-2	-3	.....	1	6

i. When , find
ii. Using a suitable scale and the standard axes, draw the graph of the given function.
iii. Write the range of x the function is negative.
iv. Express the given function using the form of $+ b$.
v. Using the graph, find the positive root and the value of to the first decimal place.

3) The following frequency distribution shows the information on the quantities of milk delivered by 45 dairy farmers to a dairy collection centre in a certain day.

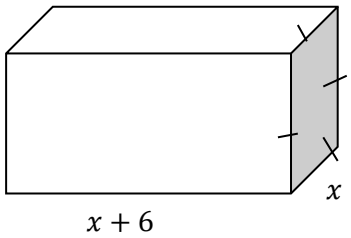
Amount of milk(litre)	5-9	10-14	15-19	20-24	25-29	30-34	35-39
Number of dairy farmers	3	5	6	12	9	7	3

i. What is the modal class of the above distribution?
ii. Find the mean quantity of milk that is given by a farmer to the centre in a day taking the mode as the assumed mean or using any other method.
iii. If it is paid Rs.120 for per litre of milk, find the monthly income of a dairy farmer.
iv. If the dairy collection centre will be received 5% of commission of amount of money for 1Lof milk. Show that the total commission the centre received will be exceeded the Rs.186 000.

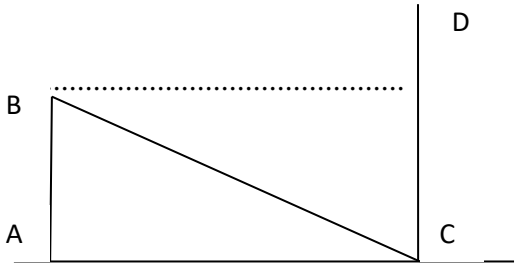
4) **a**) The ratio between the price of a book and a pen is 35:3. The total price of two books and 3 pens is Rs.790.
i. If the price of a book is x, a pen is y, build up a pair of simultaneous equations .
ii. Solving the simultaneous equations, find the price of a book and a pen.

b) Dulen plans to make $\boldsymbol{n}$ parcels which contain two books and 4 pens each. However he has Rs.4200.
i. Using the above information, build up an inequality using $\boldsymbol{n}$
ii. Solving it, find the maximum parcels that he can prepare.

5) The figure shows that a cuboidical wooden plank with square shaped cross section. The length of its square face is x units and the length of the wooden plank is $x + 6$. The total surface area of the wooden plank is 120 units. Show that the quadratic equation $x^2 + 4x - 20 = 0$ is satisfied by x and the length of the wooden plank is 8.9 units by solving it. (Take $\sqrt{6} = 2.45$).



6) AB is a vertical post on the horizontal ground and the top of the post is B.CD is an another post 15m away from AB on the same ground and the top of it is D. The angle of elevation of C from B is $40°$. A wire of length 12m is attached at C from B. (neglect the length of the wire that used to attach to the point)



i. Copy the given diagram and insert the given information.
ii. Find the height of AB to the nearest metre using trigonometric tables.
iii. If an another wire of length 20m is attached at D from B, Show that the magnitude of the angle between two wires is $60°$ which is the nearest degree.

Part B

- **Answer only five questions.**

7) Wishmi and Ashini start to collect money to their tills on the first day of January. After that, they collect money to tills week by week according to the following pattern.

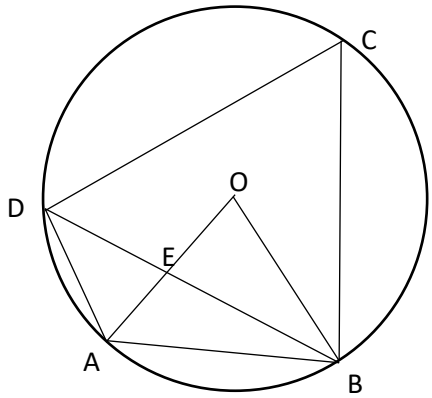
Wishmi : 500, 510, 520, 530, ...
Ashini : 5 , 10 , 20 , 40 , ...

i. According to which progression does Wishmi collect money ?
ii. How much does Wishmi collect money when the 11^{th} week ?
iii. How much does Ashini collect money when the 11^{th} week ?
iv. At the end of the 11^{th} week , whose till has more money ?

8) Using a pair of compass , straight edge with cm/mm scale and denoting construction lines clearly ,

i. construct the rhombus ABCD such that $AB = AD = 6cm$ and $B\hat{A}\,D = 60°$.
ii. construct the perpendicular bisector of the side BC and name the point where it meets BC as P.
iii. construct the circle passing through the point C, touching the base AB at B and name its centre as O.
iv. Without measuring evaluate $B\hat{O}P$ giving reasons.

9) A circle of the centre O is shown in the picture. AOB is an equilateral triangle. According to the given information show that $D\hat{C}B = 90° - O\hat{B}E$

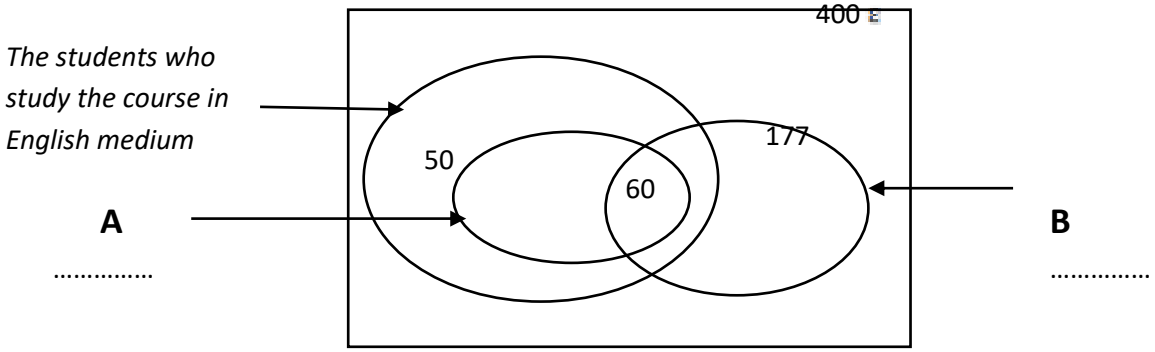


10) The midpoint of the side AB is X of the ΔABC. The line which is drawn from X is parallel to the line AC and the line which is going through the point C , parallel to the line AB meet at D. XD and BC are intersected at O.

i. Draw a rough diagram to indicate the above information.
ii. Show that $\Delta BXO = \Delta DOC$
iii. Prove that the quadrilateral BXCD is a parallelogram.

11) A cylindrical vessel of base radius $\boldsymbol{r}$ and height three times the radius is filled with water to $^2/_3$ of its height, If 12 solid metal spheres of radius $\boldsymbol{a}$ are placed in the cylindrical vessel filled with water the water reaches the overflow level,
show that $\boldsymbol{r = 2\sqrt[3]{2}\, a}$, if $\boldsymbol{a = 1.5cm}$, find the radius of the cylindrical vessel to the nearest whole number using logarithmic table.

12) The information about 400 male and female students are studying in an educational institution that can study the subjects of Mathematics, Science and History in both English and Sinhala medium is shown in an incomplete Venn diagram below.



i. if $A \cap B = \{the\ students\ who\ study\ both\ Math\ and\ Science\}$, and if Science can be studied only in English medium, then write the appropriate name to call the sets given as A and B.
ii. If the students who study Sinhala medium Math is twice the students who study English medium Math, find the number of students who study Sinhala medium Math.
iii. if the students who study History is 170, find the number of students who study only English medium Science.
iv. Find the total number of students who study Sinhala medium subjects in this institute.
v. Write the number of students who study English medium Math as a percentage of the total number of students.

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