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மேல் மாகாணக் கல்வித் திணைக்களம்
Department of Education - Western Province

වර්ෂ අවසාන ඇගයීම
ஆண்டிறுதி மதிப்பீடு - 2018
Year End Evaluation 10-7

අදිශ්‍ය තரம் Grade	10	விடயம் பாடம் Subject	Mathematics	பத்திர வினாத்தாள் Paper	I	காலம் Time	02 Hours

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Name/Index No : ....

....

Signature of invigilator

Important :

For marking examinor's use only

❖ This paper consist of 8 pages.

❖ Write your index number correctly in the appropriate place on page one and page three.

❖ Answer all questions on this paper itself.

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

❖ It is necessary to write relevant steps and correct units.

❖ Marks will be awarded as follows:

02 marks each for questions 1 - 25 in part A

10 marks each for questions in part B

| Question number		Marks
A	1 - 25	
B	1	
	2	
	3	
	4	
	5	
Total		

Marked by

Part A
Answer all the questions on this paper itself.

(01) The initial Rs. 500 000 of an individual's annual income is free from the income tax. The percentage of the income tax charges for the next Rs. 500 000 is 4%. If his annual income is Rs.650 000, calculate the annual income tax to be paid.
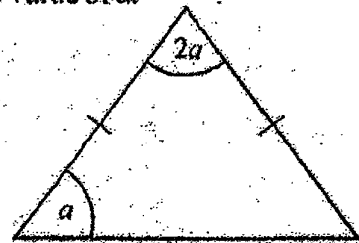
(02) Simplify. $\dfrac{3}{x} + \dfrac{1}{2x}$
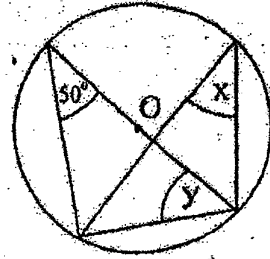
(03) Write the shaded region in set notation.
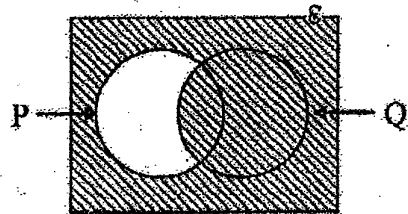
(04) Express in logarithmic form. $x = a^y$

(05) According to the information given in the figure, find the value of a.


(06) Solve. $\dfrac{P}{3} - 1 = 4$

(07) The center of the given circle is O. According to the given information find the value of x and y.

(08) Motor car takes $3\frac{1}{2}$ hours to travel 175km. Calculate the average speed of it.

(09) Find the least common multiple of the algebraic terms $6x^2y$ and $4xy^2$.

(10) In the given figure, AB = DC. Write the pair of angles that should be equal to become the two triangles ABC and BCD congruent under S.A.S case.
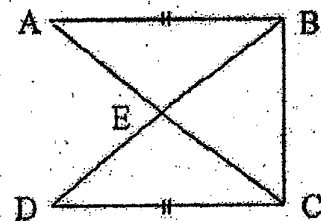
(11) The height of a cylinder with the diameter of the base 14cm is 15cm. Calculate the area of the curved surface of it. (Area of the curved surface of a cylinder with the radius r and the height h is $2\pi rh$.)

(12) In the figure, ABCD and BEFC are two parallelograms. According to the given information,

   i.   Find the AD length.
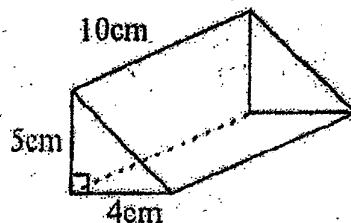
   ii.   Find the magnitude of $A\hat{D}B$.
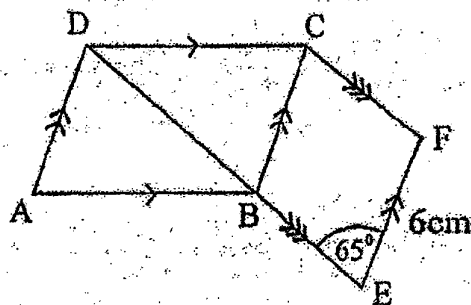
(13) From the following, select and underline the statements which contain discrete data.

   i.   The daily sales of the quantity of rice during a month.

   ii.   Number of members in each family in a certain village.

   iii. Marks obtain by a group of students for a mathematics paper.

(14) In a random experiment, A and B are two events which are not mutually exclusive. If $P(A) = \frac{1}{3}$, $P(B) = \frac{3}{4}$ and $P(A \cap B) = \frac{1}{4}$, find $P(A \cup B)$.
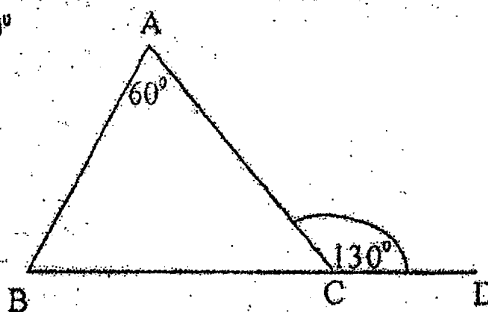
(15) Find the volume of the prism.

10cm

5cm

4cm

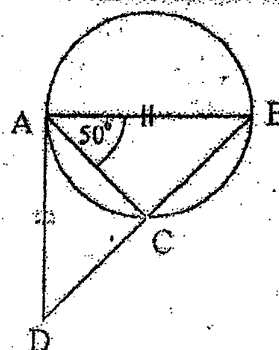(16) Write down the gradient and the intercept of the straight line which passes through the points (0,5) and (3,8).

(17) Obtain the first approximation of $\sqrt{34}$.

(18) In the given figure, if $B\hat{A}C = 60°$ and $A\hat{C}D = 130°$ find the magnitude $A\hat{B}C$.
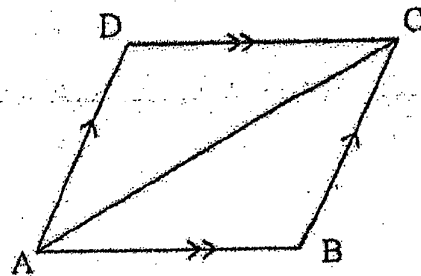
A

60°

130°

B   C   D

(19) Find the factors. $x^2 - x - 42$

(20) AB is a diameter of the circle. If AB = AD, find the magnitude of $A\hat{D}C$.
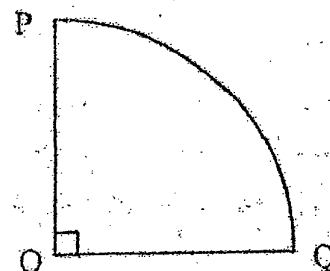
A   50°   B

C

D

(21) Food sufficient for 6 days for 10 soldiers has been stored at a certain camp. If another two soldiers were assigned to the camp, for how many days will those food be sufficient?

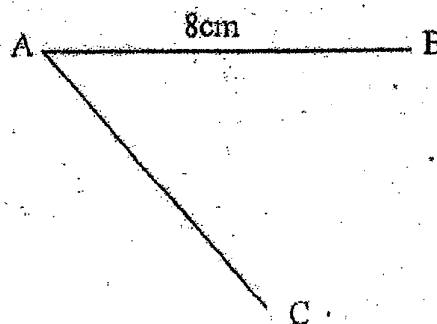(22) If the area of the ABCD parallelogram is 75cm², find the area of △ABC.

(23) If the perimeter of the given figure is 50cm and the PQ are length is 22cm, find the radius of the sector.

(24) Solve the inequality $4-5x>19$.

(25) In the given figure, AB=8cm. Draw the sketch of the relevant constructions needed to obtain the point P on the line AC, which is equidistant to the points A and B.

Part B
Answer all the questions on this paper itself.

(01) A water tank is completely filled with water. $\frac{2}{5}$ of the water in it was wasted. $\frac{5}{6}$ of the remaining water is used.

    (i) What fraction of the whole quantity of water is remained after the wastage?

    (ii) Express the used quantity of water as a fraction of whole quantity of water.

    (iii) After that, the rest of the water is filled equally into three containers with the same capacity. What fraction of the whole quantity of water is filled into the containers?

    (iv) If the volume of water in one container is 25*l*, what is the capacity of the tank in liters?

(02) The figure shows a sketch of a window grill with measurements which is consist of a semi circle and two squares.

    (i) Find the area of the large square.

   (ii) Find the area of the semi circle.

8.2cm

56cm
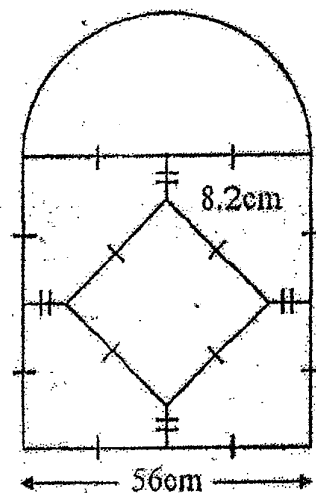
    (iii) If iron rods are used to make the grill, find the length of the iron rod which is needed for the semi circular arc.

    (iv) Find the total length of the iron rods which is needed to make the grill.

(03) (a) It takes 8 days for 6 men to paint a school building. During the first 4 days only 6 men were assigned to the work.

(i) How many man days are needed to complete the whole work?

(ii) What fraction of the whole work is done during the first 4 days?

(iii) How many more men are needed to complete the remaining work on expected date?

(iv) If the labour charges of a man is Rs. 2000 per day, what is the total amount that should be paid as the labour charges for the whole work?

(b) A certain municipal council charges 8% of the assessed value as annual rates from the shops within its administrative domain. If a certain shop pays Rs. 2400 as quarterly rates, calculate the annual assessed value.

(04) A column graph which provides information on the lunch packets ordered by 180 people who were participated for a seminar and an incomplete table prepared to draw a pie chart to represent the above information is given below.
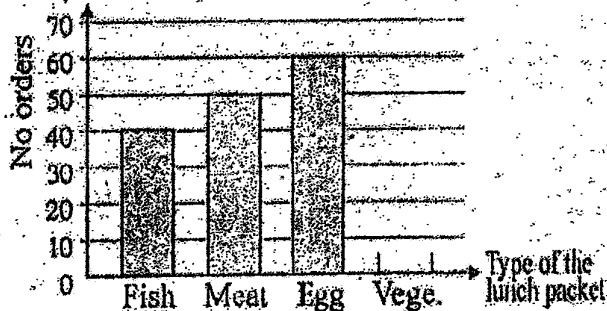

Type of the lunch packet	no of orders	Angle of the center of the sector
Fish	40	$360 \times \frac{40}{180} = 80°$
Meat	50	$360 \times \frac{50}{180} = $ ....
Egg	60	$360 \times \frac{60}{180} = $ ....
Vegetable	....	$360 \times \frac{}{180} = $ ....
	180	

(i) Find the number of people who ordered vegetable lunch packets and fill the relevant blank in the table. Represent it on the column graph.

(ii) Fill in the blanks in the table to draw the pie chart.

(iii) Draw the pie chart on the given circle.

(iv) Express the ratio between the number of people who prefer fish and egg in simplest form.
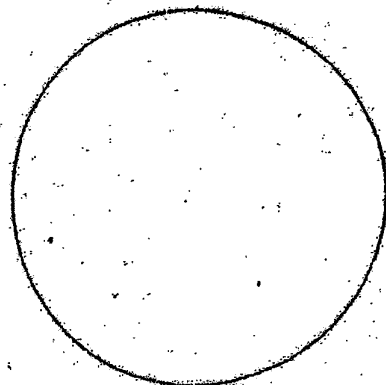
(05) (a) In a certain game there are two wheels to spin at the same time. One wheel is marked in colours and the other wheel is marked in numbers. The winner is selected by considering the colour and the number which is in front of the arrow heads.
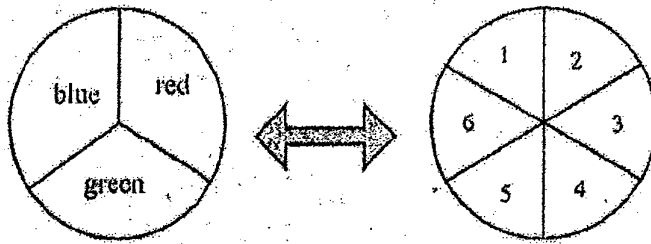

(i) Mark all the possible results obtained by spinning the two wheels at the same time, on the given grid.

(ii) Find the probability of getting an even number with green colour.

(iii) Find the probability of getting an odd number with any colour.

(b) Two students A and B are facing for a practical exam. The teacher claims that the probability that A passing the exam is $\frac{1}{3}$ and the probability that B passing the exam is $\frac{3}{4}$.
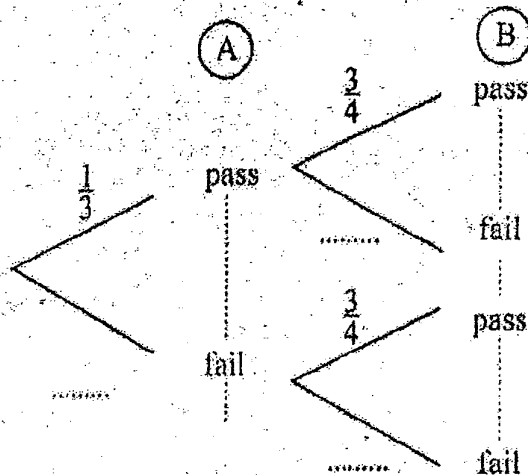
(i) Using the above information, complete the given tree diagram.

(ii) Find the probability that A passing the exam while B getting failed.

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❖ Answer 10 questions selecting 05 questions from part A and 05 questions from part B.
❖ Each question carries 10 marks.
❖ Area of the curved surface of a right cylinder with the radius r and the height h is $2\pi rh$ and the volume of it is $\pi r^2 h$.

Part A
Answer five (05) questions only.

(01) An incomplete table of values prepared to draw the graph of the function $y = 2(x^2 - 2)$ is given below.

x	-3	-2	-1	0	1	2	3
y	14	4	-2	......	-2	4	14

   (a) (i) Find the value of y, when $x = 0$.

      (ii) Taking 10 small divisions along the x axis as one unit and 10 small divisions along the y axis as two units, draw the graph of the above function.

   (b) Using the graph,

      (i) Find the minimum value of the function.

      (ii) Find the roots of the equation where $y = 0$.

      (iii) Find the range of the values of x where function increase positively.

      (iv) If the above graph is moved upwards along the y axis by 2 units, write the equation of the new graph in the form $y = a(x^2 - b)$.

(02) Mr. Perera who borrowed Rs. 250 000 from a certain financial institution for an annual interest rate of 10% promising to settle the loan in three years, deposited that amount in another financial institution which pays a monthly simple interest rate of 2%. Show by giving reasons whether the total interest received after three years from the deposited amount be sufficient to settle the loan.

(03) (a) Make 'y' the subject of the formula $x = \sqrt{\dfrac{y-b}{a}}$

(b) Price of a bun is Rs. 5 more than the twice of the price of a banana. Price of 3 buns and 2 bananas are Rs. 95.

   (i) By taking the price of a bun as x and the price of a banana as y, build up a pair of simultaneous equations using the above information.

   (ii) Solve the simultaneous equations and find the price of a bun and the price of a banana.

(04) (a) ~~Solve.~~ Simplify $(x+2)^2 - 3(x-2)$

(b) In the parallelogram ABCD, the perpendicular drawn from D to AB is DE. The length of DE is 3cm less than the length of AB. Area of the ABCD parallelogram is 40cm². By taking the AB length as x centimeters, build up a quadratic equation. Solve the equation and find the AB length.
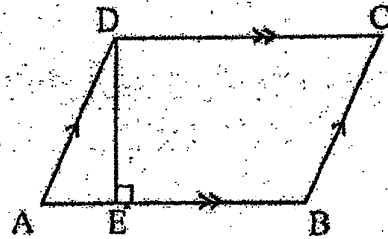
(05) A frequency distribution containing information on the amount of rice that was sold during a month is given below.

Amount of rice (kg)	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35
No of days (f)	2	3	5	8	6	4	2

   (i) What is the model class of the distribution?

   (ii) By taking the mid value of the model class as the assumed mean, find the mean amount of rice sold in 30 days in kilograms.

   (iii) If this pattern of sales is expected to continue during the next months too, calculate the amount of rice that should be stored to be sufficient for the month December.

(06) (a) Figure shows a 15m tall AB vertical tower which was fixed on the horizontal ground. When observing from the bottom (A) of the tower, the angle of elevation of the top of the tree is 45°. When observing from the top (B) of the tower, the angle of elevation of the top of the tree is 30°.
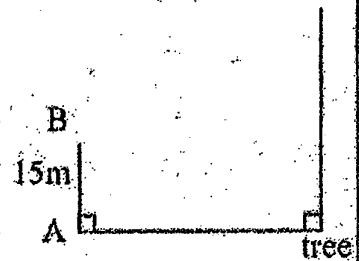
   (i) Draw a suitable scale diagram to represent the above information, taking the scale 1 cm represents 5m.

   (ii) Using the scale diagram, find the height of the tree.

(b) The length of a side of a cubic shaped water tank is 1.5m. The tank is filled using a pipe through which water flows at a uniform rate of 125 liters per minute.

   (i) Find the capacity of the tank in liters.

   (ii) How many minutes will it take to fill the tank completely?

(07) (a) n^{th} term of an arithmetic progression is $T_n = 7 - 3n$.

      (i) Write the first three terms of the arithmetic progression.

      (ii) What is the common difference of it?

      (iii) Which term of it is (-29)?

      (iv) Find the sum of the first 12 terms of it.

  (b) Find the 8th term of an arithmetic progression which starts from the 3rd term of the above mentioned arithmetic progression and having the same common difference.

(08) For the following constructions, use only the straight edge with the scale cm/mm and the pair of compasses only. Show the construction lines clearly.

      (i) Construct the ABCD rhombus with AB = 5cm and $A\hat{B}C = 60^0$.

      (ii) Draw the diagonal BD and construct a line parallel to BD, from C. Produce the line AB such that the parallel line meets AB at E.

      (iii) Construct the perpendicular bisector of BE.

      (iv) Construct the angle bisector of $C\hat{B}E$.

      (v) Mark the intersection point of the above constructions (iii) and (iv) as O and draw the circle with the radius OB.

(09) In the figure, the points A, B, C and D are situated on the circle such that AD = AB. The side BC is produced to E such that DC = CE. Giving reasons prove that AC // DE.
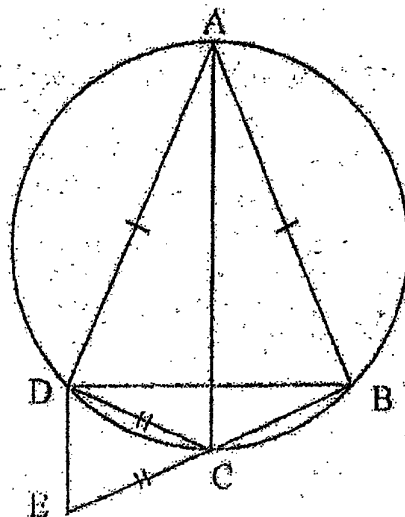
(10) (a) Write two characteristics of a parallelogram.

(b) In the parallelogram ABCD, the mid point of the diagonal AC is O. The line drawn parallel to AB through O meets the side AD at X and the side BC at Y.
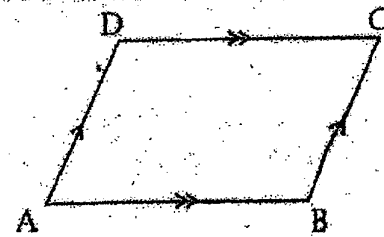
(i) Copy the diagram and mark the given data on it.

(ii) Show that the $\triangle AOX$ and the $\triangle COY$ are congruent.

(iii) Prove that the quadrilateral AYCX is a parallelogram.

(11) (a) Half of a cylindrical shaped container with the radius a is filled with water. When a solid triangular prism with the area of the base x and the height a is put inside the container, the water level was risen from h. Show that $x = \pi a h$.
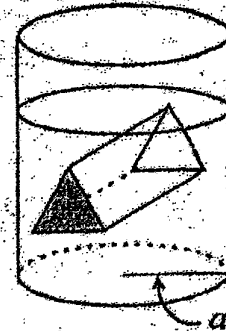
(b) If $\pi = 3.14$, $a = 2.5$ cm and $h = 2$ cm, using logarithmic tables find the value of x.

(12) (a) If $n(P) = 40$, $n(Q) = 35$ and $n(P \cup Q) = 60$, using the set formula or other method, find the value of $n(P \cap Q)$.

(b) From 50 children who participated for a birthday party, 28 ate ice-cream and 15 ate fruits for the desert. Everyone who ate fruits ate ice cream too.

(i) Represent the above information on a Venn diagram.

(ii) How many of them ate only ice cream?

(iii) Those who didn't eat ice cream, ate pudding. How many children ate pudding?

(iv) If the children who ate fruits are denoted by A and the children who ate ice cream are denoted by B, denote the set of children who ate only ice cream in terms of A and B.