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முழுப் பதிப்புரிமையுடையது]

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மேல் மாகாண கல்வி திணைக்களம்

Western Provincial Education Department

පළමු වාර ඇගයීම - 2018

முதலாவது தவணை மதிப்பீடு - 2018

First Term Evaluation - 2018

10 ශ්‍රේණිය

தரம் 10

Grade 10

ගණිතය II පත්‍රය

கணித வினாதாள் -II

Mathematics Paper - II

පැය තුනයි

மூன்று மணி நேரம்

Three Hours

Important:

- Answer 10 questions by selecting 5 questions from part A and 5 questions from part B.
- Write relevant steps and correct units when answering the questions.
- Each question carries 10 marks.
- Volume of the prism = Area of the cross section x height

Part A

Answer five (05) questions only

01. An incomplete table of values used to draw the graph of the function $y = 3x + 2$ is given below.

x	-3	-2	0	1
y	-7	-4	2	

- Find the value of y, when $x = 1$.
- Using a suitable scale draw the graph of the function $y = 3x + 2$
- Write the gradient and the intercept of the graph $y = 3x + 2$
- Draw the straight line which passes through the points (0, -3) and (1, 0) on the same Cartesian plane.
- Write a special characteristic that you can observe from the above two straight lines by giving reasons.

02. The following table represents the information on the daily income of 80 employers who are working at a certain company. (1000-1200 means greater than or equal to 1000 and less than 1200)
Copy down the table and answer the following questions.

Daily income (Rs)	No of workers (f)	Mid value (x)	fx
1000 - 1200	9	-	-
1200 - 1400	12	-	-
1400 - 1600	14	-	-
1600 - 1800	20	-	-
1800 - 2000	15	-	-
2000 - 2200	10	-	-

- What is the minimum daily income of a worker?
- What range of the income does the most workers receive?

- iii. Using the above graph, calculate the mean daily income of a worker.
- iv. Accordingly, if there are 22 working days in a certain month, find the total amount needed for monthly salary of the workers.

03. Piyal loaned out Rs. 20 000 from a financial institute for 12% of annual simple interest rate.
- i. Find the interest that he should pay at the end of the year.
 - ii. Find the total amount that he should pay to settle the lone after 11\$2years.
 - iii. He opened a fixed deposit in a certain bank from the money he loaned out without settling the loan. After 3 years he received a total amount of Rs. 30 800. Find the simple interest rate offered by the bank.
 - iv. If he settled the loan after receiving the money from the bank, find the amount remaining with him.

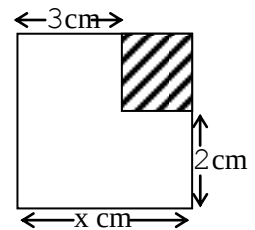
- 04) An observer who is on the top of a light house, observes a ship which is moving towards the light house at an angle of depression of 30^0 at the point P. After moving 40m towards the light house, at the point Q, he observes the ship with an angle of depression 60^0 .
- i. Name the instrument which can be used to measure the angle of elevation and the angle of depression. Represent the above information in a sketch, with relevant measurements.
 - ii. By taking 1cm to represent 20m, represent the above information in a scale diagram and find the height of the light house in meters.

- 05) (a) Simplify.

- i. $(3 + x)(5 - x)$
- ii. $(x + 3)^2$

(b)

- i. Figure shows a square with the length of a side x cm. A rectangular shaped portion with the length 3cm less than x and the breadth 2cm less than x , is removed from the square. Express the area of the rectangle in terms of $Ax^2 + Bx + C$.
- ii. If $x = 5$ cm, show that a rectangle which is equal to the area of the shaded portion and two squares can be cut out from the large square. Draw a sketch with relevant measurements to show it.



- 06) (a) Factorize the following algebraic expressions.

- i. $100 - n^2$
- ii. $5x^2 - 7x + 2$

- (b) Find the value using the knowledge on factors.

$$87^2 - 4 \times 87 - 21$$

- (c) Solve the following linear simultaneous equations.

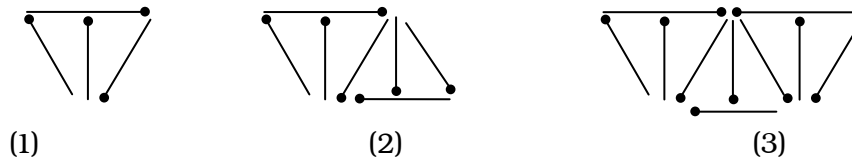
$$3x + y = 18$$

$$x + y = 8$$

Part B

Answer five (05) questions only.

07) Figure shows the first stages of a pattern made using match sticks.

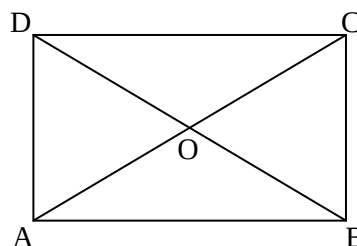


- i. Draw the fourth stage of the pattern in your answer sheet and write the first four terms of it.
- ii. Write the n^{th} term of the number pattern in terms of n .
- iii. Hence find the number of match sticks in the 50^{th} stage.
- iv. Which stage of the pattern have 301 match sticks.
- v. Write the n^{th} term of the number pattern 2, 5, 10, 17,.....

08) For the following constructions use only the straight edge with the scale mm/cm and the pair of compasses.

- i. Draw the straight line $AB = 8\text{cm}$ and construct the perpendicular bisector of it.
- ii. Name the intersection point of AB and the perpendicular bisector as C and mark the point D on the perpendicular bisector such that $CD = 3\text{cm}$.
- iii. Join AD and find the length of it.
- iv. Name the theorem that you have used to find the AD length.
- v. Construct the angle bisector of $\hat{ACD}$ and construct the $CDEF$ square with the length of a side 3cm . the points E and F are situated on the angle bisector and the line AB respectively.

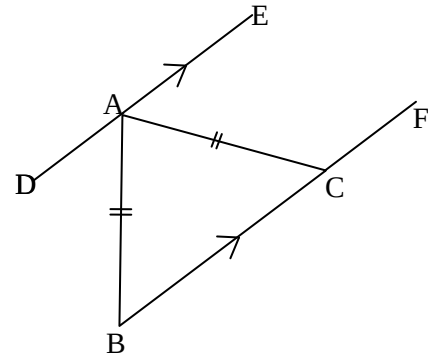
09) In the figure, $ABCD$ is a rectangle. AC and BD diagonals meet at O . Copy the diagram on your answer sheet.



- i. Show that $\triangle ABC \cong \triangle ABD$. Hence show that the diagonals AC and BD are equal in length.
- ii. The line drawn through O parallel to BC meets DC at X and AB at Y . Show that
Area of $BCXO$ trapezium = Area of $BCOY$ trapezium

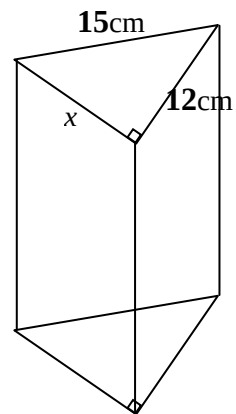
- 10) In the triangle ABC, $AB = AC$. DE is drawn through A, parallel to BC. Copy the angle in your answer sheet. By giving reasons,

- Show that $\widehat{CAE} = \widehat{ABC}$
- If $\widehat{BAC} = x$, find the value of $\widehat{ABC}$ in terms of x .
- Find the value of $\widehat{DAB}$ in terms of x .
- If $\widehat{CAE} = 70^\circ$, find the value of x .



- 11) Figure shows a 50cm long solid metal prism with a right angle triangular cross section.

- According to the information given, find the value of x .
- Find the volume of the prism.
- This prism is melted and a cuboid is made with the length 12cm, breadth 9cm and the height h . Find the height of the cuboid.
- 675cm^3 of metal is added to the volume of metal collected by melting the prism and a cube is made with the whole volume of metal. Find the maximum length of the side of the cube.



- 12) A box contains identical pack of cards in which the letters of the word MATHEMATICS written on it. No letter is repeated in any card.

- Write the sample space of the event, obtaining a card randomly from the box.
- Write the probability of obtaining the letter A.
- If X denotes the event, obtaining a letter from the box which belongs to the set “the letters of the word CAT”
 - What is $n(X)$?
 - Find $p(X)$.
 - Write down the elements of X' .