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**II**

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**Mathematics - II**

**meh 03**

**Three Hours**

**11 fY%aKsh – m<uq jdr we.hsu - 2023**

***Grade 11 – First Term Examination - 2023***

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புனித பேதுரு கல்லூரி, கொழும்பு 4

***St. Peter's College - Colombo 04***



**Part A**

* **Answer 5 questions only.**

**The volume of sphere of radius ‘r’ is** .

01. An incomplete table prepared to draw the graph of the function is given below.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***x*** | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| ***y*** | 15 | 5 | -1 | \_\_\_\_ | -1 | 5 | 15 |

i. Find the value of when

ii. Using the scale of 10 small divisions as one unit along axis10 small divisions as two units along axis, draw the graph of the above function on a graph paper.

iii. Write down the coordinates of the turning point.

iv. Write the equation of the axis of symmetry.

v. Write down the intervals of values of for which function is negative.

vi. Write down the roots of the equation

02. a). i. 8% of annual tax is charge on a boutique with assessed annual value of Rs.40,000/- by Provencal council. Find the annual tax amount for this boutique.

ii. For another boutique which belongs to the same provincial council, the owner pays Rs. 1000/- as a quarterly tax. Find the assessed annual value of the boutique.

b). Kamal obtains a loan of Rs. 50,000/- at 12% simple rate of interest for a business purpose. How much the interest for 8 months.

03. The bearing of from which is situated on a flat ground is and the distance is . is situated from a bearing of and away from

i. Taking the scale as 1:100,000 draw a scale diagram to represent above data.

ii. Find the angle

iii. Find the distance to in

iv. Find the bearing of from

04. A packet of toffees was given to a certain class students, and they are planning to distribute it among them.

* If 5 toffees are given to each students the 4 toffees are left.
* If 7 toffees are given to each students the 20 toffees are not enough.

By taking the number of toffees as and number of students in the class as construct pair of simultaneous equations and by solving them. Find the number of toffees and the number of students in the class separately.

05. The sum of the length of two adjacent sides of a rectangle is

10 cm

*x*

and the length of a diagonal is .

Show that, when the breadth of the rectangle is taken as

, it satisfies the quadratic equation

and by solving quadratic equation.

Find separately the length and the breadth of the rectangle. (Length > breadth)

06. The below table shows the amount of polythene collected as garbage during 30 days by a municipal council of Mihintale.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Mass class interval (kg)** | 10 - 15 | 15 - 20 | 20 - 25 | 25 - 30 | 30 - 35 | 35 - 40 | 40 - 45 |
| **Number of days (f)** | 2 | 2 | 7 | 9 | 6 | 3 | 1 |

(10 - 15 represent the values 10 or greater than 10 and less than 15).

i. Write down the model class.

ii. Taking mid value of model class as assume mean, Find the mean mass of polythene collect during a day, nearest kg.

iii. Find the mass in metric tons of polythene collected during 100 days.

**Part B**

* **Answer 05 questions only.**

07. A drill display the students were lined up in such a way that 5 children in the first row and the next row, there are 3 more students than the first row and so on.

i. Write in order the number of students in the first four rows.

ii. Show that the nth term of this progression is given by

iii. In which row are there 38 students?

iv. If only 390 children have been selected for this drill display. Show with reasons whether the first 15 rows can be filled when the students are placed in the above manner.

08. By using the straight edge with the scale and the pair of compasses and showing the constructions lines clearly do the following constructions.

i. Construct a circle of radius and name its centre as .

ii. Mark point on the circle and construct a chord of length.

iii. Construct the triangle **,** where and

iv. Construct the perpendicular bisector of and name the point at which it interests the major are of of the circle as .

v. Construct the straight line parallel to through .

09. a). In the triangle ,

E

D

C

B

A

and

Find the value of .

b). In the quadrilateral ,

side is produced to

and .

i. Represent the above data in your diagram.

**A**

**B**

**E**

**C**

**D**

**M**

ii. Prove that is a parallelogram.

iii. Show that

O

P

B

A

Q

10. a). In the diagram, centre of the circle

is Points and are on the circle.

If show that

P

O

T

R

Q

b). is a chord of a circle with centre

and

If Find the value of with reasons.

11. In a class there are 40 students. They learn Drama and music as aesthetic subject.

Students who study drama

Boys

* There are 25 boys in the class.
* 20 students study drama.
* 8 girls study music

i. Copy the given Venn diagram and include the above information in it.

ii. How many boys study drama?

iii. How many girls study drama?

iv. If all the girls study music, Represent this new data in a suitable another Venn diagram.

12. A solid metal prism with area of cross-section and length is melted and without wasting any metal a hemisphere with the radius is made. Show that

h

(Volume at prism = area of cross-section )

And when and . Find the value of to the nearest first decimal place using logarithmic tables.