රිච්මන්ඩ් විද්‍යාලය **Richmond College**
පළමු වාර පරීක්ෂණය - 2020
**First Term Test - 2020**

| 32 | E | I,II |

**Mathematics I, II**

**Time – 3 hrs**

**Grade 11**

**Name / Index No.......................................................**

## Part - I
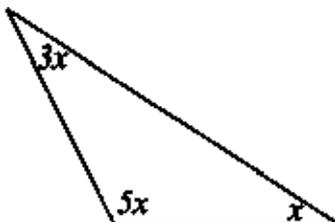
- Answer all questions in the paper itself.

Part A

1. Find the first approximation of $\sqrt{5}$

2. Find the L.C.N. of $6y^2$, 10xy and $15x^2$

3. Simplify $\frac{x}{y} \times \frac{8}{xy}$;      $x, y \neq 0$

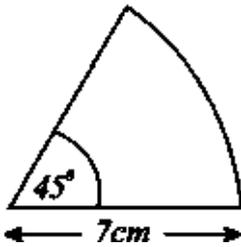4. Write $\log_3 243 = 5$ in index notation.

5. 



Find the value of $x$

6.      How much a person should pay as the interest at the end of the year when taking a loan of Rs. 25000 at the annual Simple interest rate of 8%

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7.      Solve

$$\frac{3+x}{2} = 5$$

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8.                                                                              Find the are length of this sector.



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9.      In a box there are 4 red beads, 3 blue beads and 5 black beads. A bead is taken out randomly what is the probability of taking a bead which is not black in colour.

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10.     The radius and the height of a right circular cylinder are 7cm and 12 cm respectively Find the curved surface area of the cylinder.

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11.     Solve the inequality $3x - 1 \leq x + 7$

12. Among these triangles which two triangles are congruent to each other And write down under which case they are congruent.
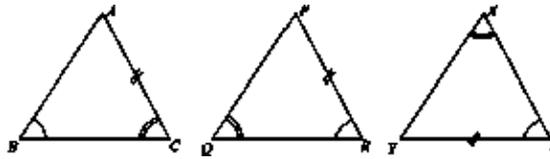
13. It takes 4 men 9 days to complete a certain task. How many men are needed to complete the same task within 6 days?

14. Write the equation of the straight line which goes through the point (0, 2) and having the gradient of (-3)
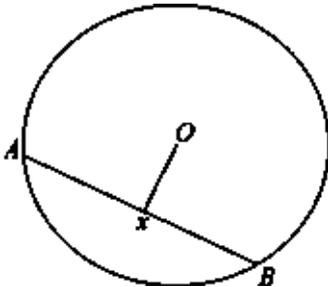
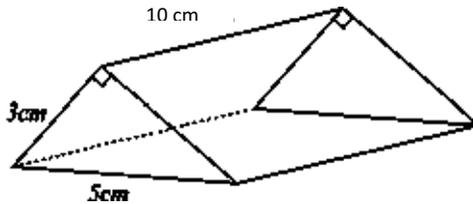15. The radius of the Circle with center O is 5cm If OX = 3cm find the length of the chord AB

16. Find the solution of $4x^2 - 1 = 0$

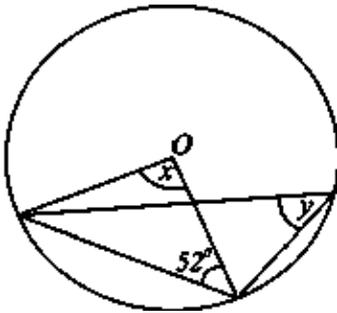17. A vehicle travels at uniform speed of 72kmh$^{-1}$ find the time takes to travel the distance of 180km

18. A = { x : x is a prime number, x < 13}
Write the elements of the set A

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19.



Draw two rectangular faces with measurements of this triangular prism.
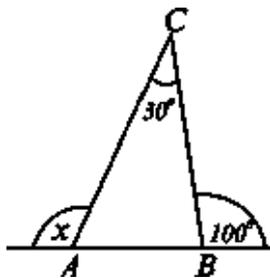
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20.



By Using the information in the figure, find the values of $x$ and $y$

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21. If the mode and the median of this distribution are equal find $x$

6, 12, 8, 8, 7, 7, $x$

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22.



By using the given information find the value of $x$

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23. a+8, a+5, a+2, ... are first 3 terms of an arithmetic progression. If the 5$^{th}$ term is 0 , then find the value of a.

24. PQ is a straight line R is moving as the area of the triangle PQR is constant. Draw the path of the paint R and state the reason.

25. A, B and C are three point of the same plane. The angle of elevation of the point C from A is 30$^{o}$. And the angle of depression of the point B from A is 40$^{0}$ include this data in the given figure.

# Part B

01.     A father distributes $\frac{8}{10}$ of his money for his wife and 3 children at the ratio of 3:5

    i.        What fraction of money gets the wife?

    ii.       If the 3 children equally divided the money they received among them, what fraction of money a child received ?

    iii.      Who gets more money, whether wife or a child? Explain with reasons.

    iv.      If the difference of money between the wife and a child is Rs. 8000 find the money that devided.

    v.       Find the money the father had before distribution.

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02.
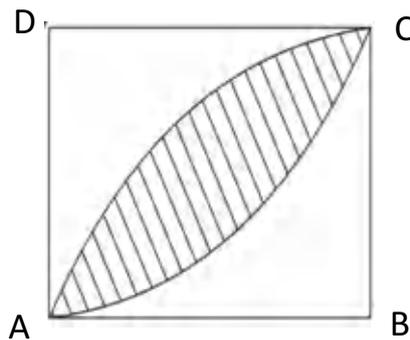


The length of a side of the square ABCD is 14cm Two arcs having B,D as the centers, have been drawn as shown in the figure.

    (a)       i.     Find the area of the square ABCD.

          ii.        Find the area of the sector ABC

          iii.        Find the area of the shaded portion.

    (b)        i.        Find the length of the are AC.

          ii.        Find the perimeters of the shaded portion.

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03.    (a)        40 % of customs duty is charged when an electrical item of Rs.24000 is imported. Find the value of this item after paying the customs duty.

    (b)        8 % of annual tax is charged on a boutique with assed annual value of Rs. 18000 by the Provencal Council.

          i.        Find the annual tax for this boutique.

          ii.        Find the tax for a quarter

          iii.        For another boutique which belongs to the same provincial council, the owner pays Rs.510 as a quarterly tax find the assessed annual value of this boutique.
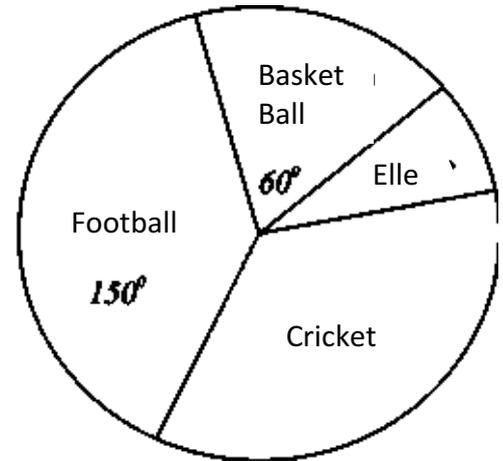
04.    The pie chart shows how is a sample of 300 students who like 4 sports after getting information's about sports.

    i.    If 100 Students like to play cricket, find the angle connected with students who like cricket

    ii.    Find the angle related with Elle

    iii.    Find the number of students who like to play football.

    iv.    Mention the relevant angles in the pie chart

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05.    (a)    Pawani takes out a button randomly from a box consisting of 2rd buttons and 3 blue buttons which are of equal size and shape, in order to attach two buttons to her frock. She replace a button equal in colour after taking the first button and another button was taken out randomly.

    i.    Represent the sample space in the grid
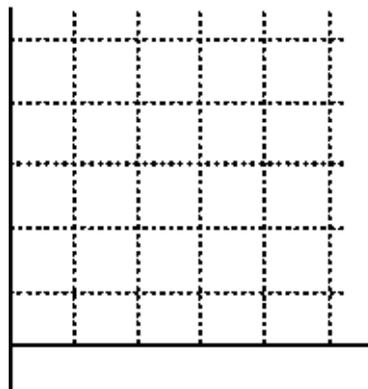
    ii.    Find the probability of getting two blue buttons.

(b)     i.    Below show a tree diagram for obtaining a blue or not in the 1$^{st}$ attempt Extend the tree diagram for the 2$^{nd}$ attempt and write the relevant probabilities.

$\dfrac{3}{5}$     Obtaining blue

$\dfrac{2}{5}$     Not Obtaining Blue
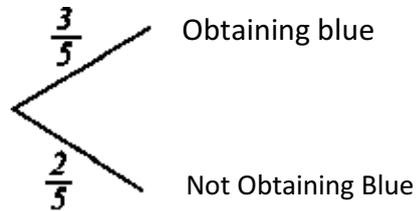
    ii.    Find the probability of getting two red buttons.

    iii.    Find the probability of getting two buttons in two colours.

# Part II

## Part A

- Answer five questions only.

1. a) Mr. Perera who owns a building pays Rs. 900 as quarter rates to the municipal council. The annual rate percentage is 15%.
   i. Find the annual rate.
   ii. Find the assessed annual value of this building.

   b) Mr. Perera is planning to rent out this building and the monthly rental is Rs. 25000. He hopes to take the advance payment of 6 months.
   i. How much he received as the advanced payment?
   ii. He deposited this amount in the bank which pays 8% annual simple interest rate. Show that Rs. 189000 amount is left over with him after paying the rates for the building by the interest he received from the bank at the end of the year.

2. i. Simplify $3\sqrt{5} + \sqrt{80}$.

   ii. Rationalize $\dfrac{\sqrt{2}}{3\sqrt{3}}$

   iii. Solve $2^{2x} \times 4^{x+1} = 64$.

   iv. Solve $\lg 4 + \lg x = \lg 25 + \lg 16$

3. i. Expand $(2x - 3)^3$.

   ii. Simplify $\dfrac{7}{x-2} - \dfrac{1}{2-x}$

   iii. Simplify $\dfrac{5x+5}{8x} \times \dfrac{4}{x+1}$

   iv. Simplify $\dfrac{x^2 + 4x}{3y} \div \dfrac{x^2-16}{12y^2}$

4. An incomplete table of values prepared to draw the graph of the function $y = -x^2 + 7$ is given below.

| x | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
|---|----|----|----|----|----|----|----|
| y | -2 | 3 | ...... | 7 | ....... | 3 | -2 |

    a)      i.    Fill the blanks in the table.

               ii.    By taking a suitable scale draw the graph of the above function on a graph paper.

    b)    By using the graph,

               i.    What is the maximum or minimum value?

               ii.    Find the values of x when y = 1.5.

               iii.    Write down the equation of the function when the above graph is shifted down 2 units along the y axis.

5.    A packet of toffees was given to a victory team and they are planning to distribute it among them. If 6 toffees are given to each student, the 8 toffees are left over. If 7 toffees are given to each student, then 7 toffees are not enough.

      i.    By taking the number of toffees as x and number of students as y, construct two simultaneous equations.

      ii.    By solving the simultaneous equations find the number of toffees and the number of students.

6.    A hemispherical container with radius 2r is completely filled with water. Then this amount of water is poured into a cane with radius r and height 2r and after this cane was filled, the remaining water was poured into a cuboid with the base of square shaped. If the side of the square is a show that the water goes up to,

$$h = \frac{10\pi r^3}{a^2}$$

If $\pi = 3.14$, $r = 10.5$cm and $a = 35$cm by using logarithms find the value of $h$.

## Part B

- Answer five questions only.

7.
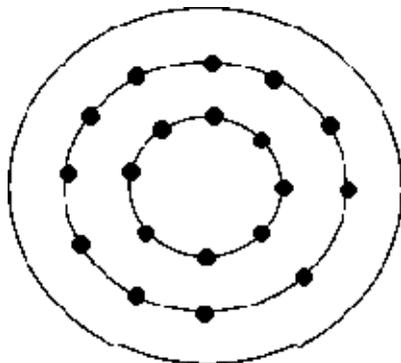


Here is a format of drill of a group of students. Here are 8 students in the first circle and 11 students in the second circle and 14 students in the third circle.

      i.    What progression do this students follow?

      ii.    How many students in the sixth circle?

      iii.    Initially they have planned to do this drill with 220 participants. But the teacher in charged asked to participate 74 more students to expand the drill with 2 more circles. Show that her statement is true.

8.  In the triangle ABC, $A\hat{B}C = 45^0$ , $BC = 8$cm and $B\hat{A}C = 60^0$
    i.   Construct the triangle ABC.
    ii.  Construct a perpendicular from A to BC. This perpendicular and the line BC meet at P. Mark the point P.
    iii. Construct the locus of the points which move equidistant to A and C. Mark the point it meets the line AC as R.
    iv.  The above perpendicular in ii and the locus in iii meet at the point Q, Mark Q.
    v.   Show that, $\hat{Q}R + P\hat{C}R = 180^0$ .

9.  Shown in the figure is a frequency distribution of the number of bricks Kapila produced on each day in his brick production place, during a month of 30 days.

    | Class interval (No. of bricks) | 61-65 | 66-70 | 71-75 | 76-80 | 81-85 | 86-90 | 91-95 | 96-100 |
    |---|---|---|---|---|---|---|---|---|
    | Frequency (No. of days) | 1 | 2 | 5 | 6 | 10 | 3 | 2 | 1 |

    i.   What is the modal class of this distribution?
    ii.  By taking the modal class as the assumed mean, find the mean number of bricks produced in a day to the nearest whole number?
    iii. Kapila received an order to supply 4500 bricks. How many days should he worked to fulfill this order?

10. 
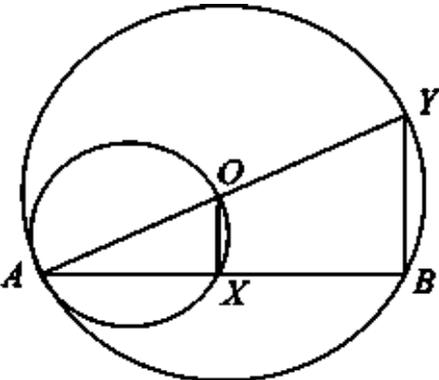


*AB* is a chord of the circle with center O. Another circle with diameter OA cuts the chard AB at X. Produced AO cuts the large circle at Y.

    i.   In this figure name two right angles. State the reasons.
    ii.  Show that $AX = XB$
    iii. Show that, $OX \parallel YB$
    iv.  Prove, $2A\hat{O}X = B\hat{O}Y$

11. ABCD is a square. The equilateral triangle ABX lies outside the square with the base of AB and the equilateral triangle BCY lies outside the square with the base of BC.
    i.   Draw the relevant figure.
    ii.  Show that the triangle DXY is an equilateral triangle.

12. Here are the details of 120 adults in a certain village.
    - 25% of males are suffering from diabetes.
    - 20% of females are suffering from diabetes.
    - Total no. of females are 64
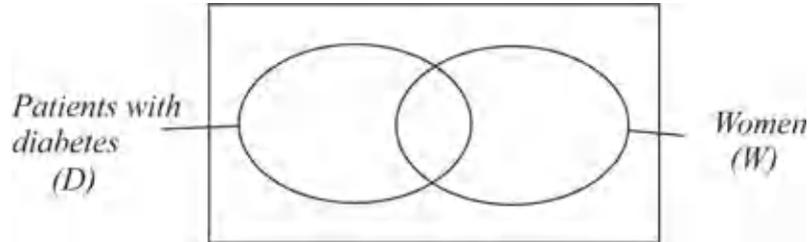


    i. Complete the Venn diagram.
    ii. How many males are suffering from diabetes?
    iii. Shade the region of females who are not suffering from diabetes.

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