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Department of Education, Southern Province

දෙවන වාර්ෂික පරීක්ෂණය 2022  
Second Term Test, 2022

10 ශ්‍රේණිය  
Grade 10

MATHEMATICS I

පැය දෙකයි  
Two hours

PART A

- ❖ Answer all the questions on this paper itself.
- ❖ Each question carries 2 marks in part A

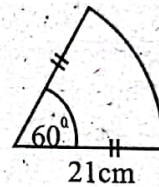
01. Select and underline the first approximation of  $\sqrt{19}$

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

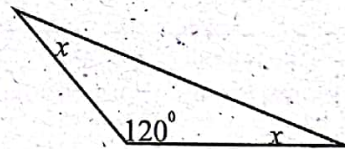
02. Fill in the blanks.

$$(2x + \dots)^2 = 4x^2 + \dots + 9$$

03. Find the arc length of the sector given in the figure.

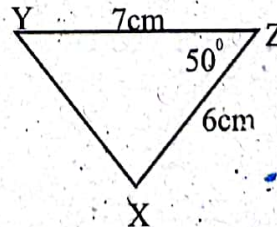
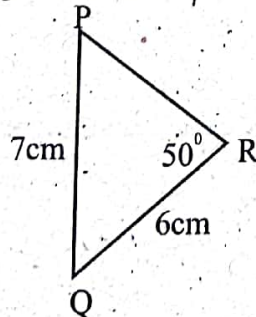
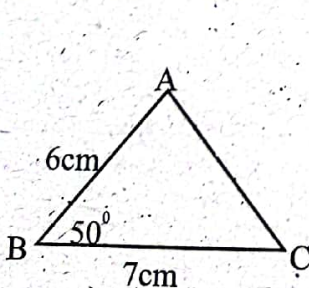


04. Find the value of  $x$



05. Find the factors.  $x^2 - 8x + 12$

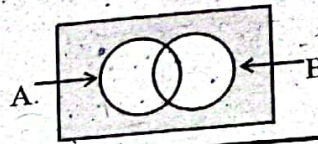
06. Name the pair of congruent triangles and write the case of congruency.



07. Solve  $(x + 3)(3x - 1) = 0$

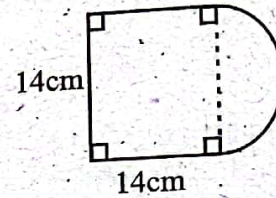


08. Name the shaded part in set notation.

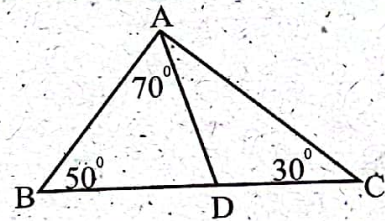


09. 12 men take 10 days to complete a certain task. How many days will be taken by 5 men to complete half of the above task.

10. Find the area of the composite figure given.



11. Name a pair of sides equal in length in the given figure.



12. Write  $\log_3 9 = 2$  in index notation.

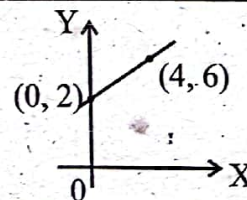
13. Simplify.  $\frac{5}{3x} - \frac{1}{x}$

14. A tap in a tank containing 500 l of water removes water at the rate of 2 l per minute. Find the time taken in minutes to empty the tank completely.

15. Fill in the blanks using suitable words.

Opposite ..... and ..... are equal in a parallelogram and the diagonals are ..... each other.

16. Find the gradient and the intercept of the graph given.

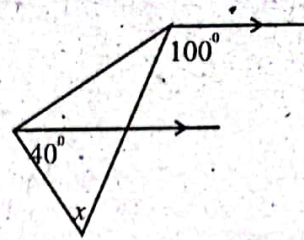


17. Find median of the numbers 4, 7, 10, 5, 9, 8, 10

18. Find the Least Common Multiple of  $2xy$ ,  $4x^2$



19. Find the value of  $x$  using given data.



20. Find the probability of getting a prime number when tossing a die numbered from 1 – 6.

21. select and underline the quadrilateral which is not a parallelogram.



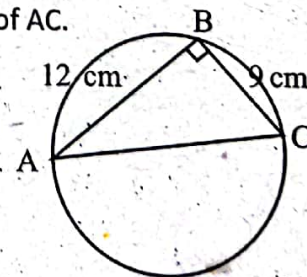
22. A train travelling at a constant speed of 20 metres per second takes 5 seconds to pass a traffic light. Find the length of the train in metres.

23. Find the value of  $x + y$  without solving the equations.

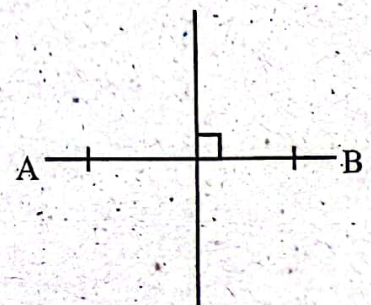
$$2x + 3y = 13$$

$$3x + 2y = 12$$

24. The diameter of the circle shown in the figure is AC. Find the length of AC.



25. A and B are 2 points which are in 5m apart. Find the locus of the points equidistance from A and B and on 3 m away from A. Name the points as P and Q.





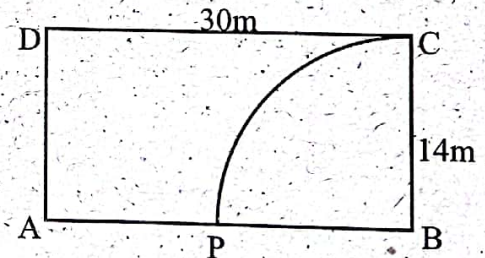
## PART B

01. Mr. Saman, who works in a private company spends  $\frac{3}{7}$  of his monthly salary for food and  $\frac{1}{4}$  of the remaining for transport.

- Find the remaining amount of money after spent for food as a fraction.
- Find the money spent for transport as a fraction of the total salary.
- Find the remaining amount of money after spent for food and transport as a fraction of the total salary.
- The amount of money remaining after spent for food and transport is Rs.12 000. He spent this amount of money for other expenses of the house. Find his monthly salary.

02. The figure shows a rectangular shaped ABCD garden of 30m length and 14m width. PBC sector is a pond.

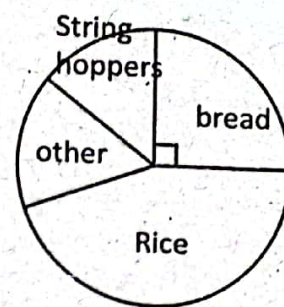
(Take  $\pi = \frac{22}{7}$ )



- Find the arc length PC.
- Find the perimeter of APCD without the pond.
- Find the area APCD.
- Instead of PBC sector, a right-angled triangular segment BCX is to be separated such that area of the right-angle triangle is equal to the area of the sector and X lies on AB. Mark the location of X in the same figure with measurements.



03. The pie chart represents the information gathered from a group of grade 10 students about the food they had for their breakfast on a particular day.



- i) If the number of students who had bread as breakfast is 10, find the total number of students in the class.
- ii) If the angle at the centre of the sector which denotes the students who had rice as breakfast is  $162^\circ$ . Find the number of students who had rice as their breakfast.
- iii) If the number of students who had string hoppers and other foods as their breakfast are equal, find the angle at the centre of the sector which denotes the number of students who had string hoppers.
- iv) On another day, 4 students who had rice for their breakfast didn't come to school. Two students who had bread for their breakfast had rice on that day. Find the angle at the centre of the sector which denotes the number of students who had bread by considering the changed data.

04. (a) The assessed annual value of a certain house is Rs. 36 000. The provincial council institution charges 8% annual rate.

- i) Calculate the rates that have to be paid for a year.
- ii) Calculate the rates that have to be paid for a quarter.
- iii) In the next year, if the rate for the quarter for that house increased by Rs.180 and there was no change in the assessed value, find the rate percentage charged by the provincial council in that year.



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Grade 10

MATHEMATICS II

පැය තුනයි  
Three hours

Important:

Extra 10 minutes for reading

- ❖ Answer 10 questions by selecting 5 questions from part A and 5 questions from part B.
- ❖ Write the relevant steps and units when answering the questions.
- ❖ Each questions carries 10 marks.

Part A

- ❖ Write the answers for 5 questions only.

01. (a) Nuwan borrowed a loan Rs. 200 000 from bank A at annual interest rate of 15% and Rs. 150 000 from bank B at annual simple interest rate on a same day. At the end of three years, he paid Rs. 521 000 as loan amount and interest from both the banks at once.

Find the annual interest rate charged by bank B.

(b) If the above total amount is to be taken from one bank, which bank is more beneficial?

02. An incomplete table prepared to draw the graph of the quadratic function  $y = -x^2 + b$  is given below.

x	-3	-2	-1	0	1	2	3
y	-4	1	4	5	4	1	.....

- i) Fill in the blank by considering the symmetry of the table.
- ii) Using the scale of 10 small divisions as one unit along the x axis and y axis, draw the graph of the above function.
- iii) Write the coordinates of the turning point of the graph.
- iv) Find the value of b.
- v) Find the value x when  $y = -1.5$



03.

- i) Factorize,  $2x^2 - 32$
- ii) Simplify,  $\frac{1}{p+3} + \frac{1}{p^2 + 5p + 6}$
- iii) Make C the subject of the formula  $F = \frac{9}{5}C + 32$
- iv) If  $F = 212$  find the value of C

04. (a) The price of 3 exercise books of 80 pages and 2 exercise books of 120 pages is Rs. 1650. The price of a 120 pages exercise book is Rs.200 more than the price of a 80 pages exercise book. Construct a pair of simultaneous equations by taking the price of 80 pages exercise book as  $x$  and the price of 120 pages exercise book as  $y$ . By solving the equations find the price of 80 pages exercise book and 120 pages exercise book separately.
- (b) Solve.  $x^2 - 5x - 24 = 0$ .

05. A cuboid shaped underground water tank is 8m long, 5m wide and 3m high.
- i) Find the capacity of the tank.
  - ii) Water flows into that tank at a uniform rate of 400 l per minute and water is pumped from that tank to another tank at a uniform rate of 150 l per minute. Find the time taken to fill the tank completely in hours.
  - iii) Find the height of the water in the tank after 2 hours in centimetres.

06. The following table shows the information about the water consumption of 40 houses in Samanpura village.

Units of water consumption	Number of houses
15	2
16	5
17	8
18	15
19	6
20	4

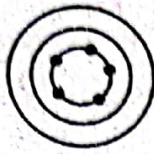
- i) Find the mode of units of water consumption.
- ii) Find the mean units of water consumption in a house.
- iii) Find the percentage of houses with more than 17 units of water consumption.
- iv) If it costs Rs.15 to produce a unit of water, find the cost of providing water to the houses in the above village during that month.



## Part B

❖ Write the answers for 5 questions only.

07. In a decoration, the first circle contains 5 bulbs and then each circle contains 3 bulbs more than the previous circle.

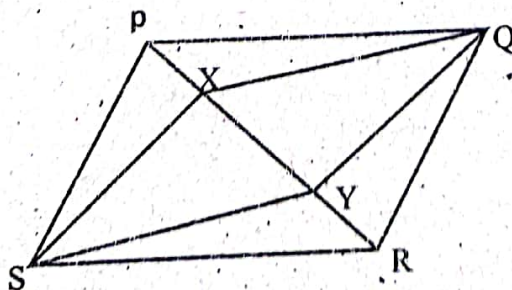


- Write the number of bulbs in the first, second and third circles respectively.
- Write an expression for the number of bulbs in  $n^{\text{th}}$  circle using  $n$ .
- Find the number of bulbs in  $10^{\text{th}}$  circle.
- Which circle is required 47 bulbs?
- A new decoration is formed by removing a bulb from each circle. Write an expression for the number of bulbs in  $n^{\text{th}}$  circle in new decoration.

08. Use only a straight edge with cm / mm scale and a pair of compass and show the construction lines clearly.

- Construct a straight-line segment AB of length 8cm.
- Construct  $\triangle ABC$  such that  $\angle C = 60^\circ$ .
- Construct the angle bisector of  $\angle C$ . Mark a point 'O' which is on 4 cm away from B and on the angle bisector.
- Construct a perpendicular from 'O' to any arm. Name it as OP. Measure and write the length of OP.
- Construct a circle by taking O as the centre and OP as the radius.

09. In the given parallelogram PQRS, X and Y are two points on PR.  $PX = RY$ . Copy the diagram and mark the data given.

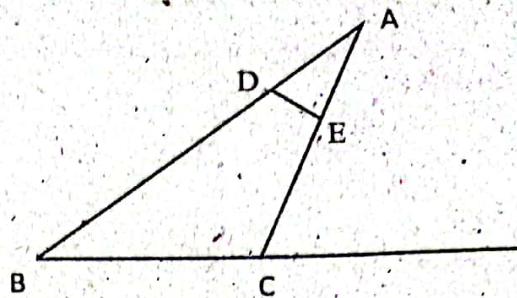


- Show that  $\triangle PXS \cong \triangle QYR$ .
- Show that XQYS is a parallelogram and the area of PQXS and QRSY are equal.



10. In the triangle ABC, points D and E lie on AB and AC such that  $AD = AE$ . BC produced and DE produced meet at F.  $DB = DF$  and  $AC = BC$

- Copy the diagram and mark the data given.
- Take  $\angle C = x$ , Write  $\angle ADF$  using  $x$
- Show that CEF is an isosceles triangle
- Find the value of  $\angle BAC$



11.

- If  $\log_2 32 = x$ , find the value of  $x$
- Find the value without using the logarithmic tables.

$$\lg 125 - \lg 5 + \lg 8 - \lg 2$$

- Find the value of  $\frac{5.6 \times 85.64}{281}$  to the first decimal place using the logarithmic tables.

2. Twenty-five students in a certain class like to watch movies. 15 students are like to watch teledramas only. 27 students didn't like to watch movies and 20 students didn't like to watch teledramas.

- Represent the above information in a venn diagram.
- How many students like to watch both movies and teledramas.
- What is the total number of students in the class?
- Find the probability that a randomly selected student from these students is like to watch movie or teledrama.



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