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Year End Term Test - 2017
Mathematics I

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Time : 2 hrs

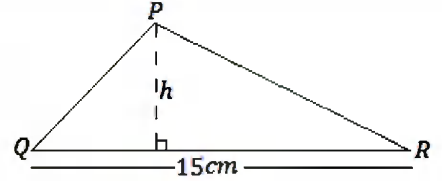
Part A

- Answer all questions on this paper itself.

01. Find the common difference of the progression,
5, 2, -1, -4,.....

02. Simplify, $\frac{x}{2} + 3 = 5$

03. If the area of the triangle PQR is 45cm^2 , Find the value of h.



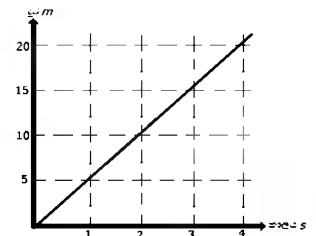
04. Simplify, $\frac{a}{3} + \frac{a}{12}$

05. Solve the inequality $x + 5 \leq 8$ and write down the set positive integral values of x can take.

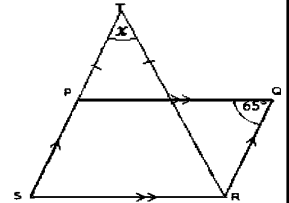
06. If $2 \times 2 \times 13 \times 13 = 676$, Find the value of $\sqrt{676}$

07. Factorize, $x^2 + 19x + 48$

08. A distance time graph of an object which is moving with uniform speed, is given below. Find the speed of the object on meter per second.



09. Using the information given in the figure, Find the value of x .



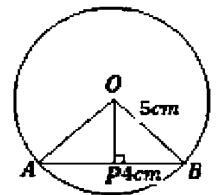
10. Find the intercept of the straight line of gradient +3 and that passes through the point. (2,7)

11. Write down two needs that must be satisfied by a quadrilateral to be a parallelogram.

12. Write down 32 as a power of base 2 and write it in logarithmic form.

13. Remove the brackets and simplify, $(x + 3(x - 2))$

14. In the figure, $OB = 5\text{cm}$ and $PB = 4\text{cm}$. Using the given information find the perimeter of the triangle AOB.

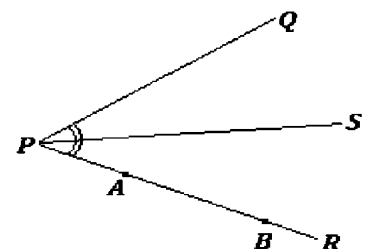


15. A cricket match has been organized to held among the schools A and B. If in there the probability of "School A being the winning school" is $\frac{2}{5}$, Find the probability of "School A being the winning school after winning the toss also"

16. A house of assessed annual value Rs 24000 is charged annual rates of 8%. ealculate the rates that have to be paid for a year.

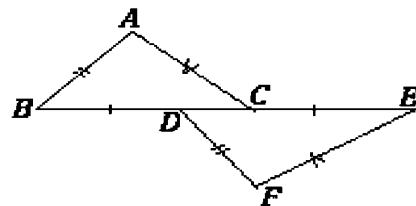
17. If $A = \{x; x \text{ is a prime number} . 0 < x < 15\}$, Write down all the elements of set A.

18. PS is a road which is equidistance from the straight boundaries. A and B are two telephone posts on the PR boundary. A lamp post is being going to fix equidistance from PQ and PR boundaries and equidistance from telephone posts A and B. Draw a clear sketch in the given diagram to represent the position of the lamp post.



19. The distance between two culverts is 5cm in a survey plane of a city. If this survey plan has been drawn to the scale 1:5000, Find the actual distance between two culverts.

20. Using the information given in the diagram, write down two congruency cases that can be used to congruent triangles ABC and DEF.

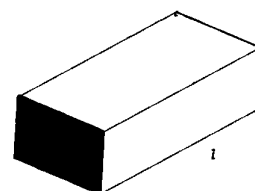


21. Without solving the following equations, find the value of $x + y$

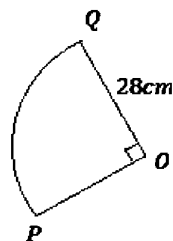
$$3x + 5y = 37$$

$$x + 3y = 19$$

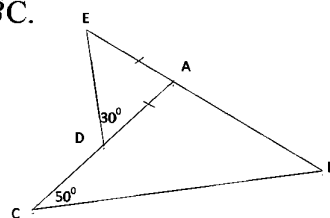
22. A cuboidal shaped wooden block of volume 480cm^3 is given in the diagram. If the area of the shaded surface is 20cm^2 find the length (l) of the wooden block.



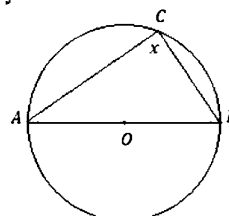
23. According to the given measurements, calculate the arc length of PQ.



24. Using the information given in the diagram, find the magnitude of \hat{ABC} .



25. The points A, B and C lie on the circle with center O. Find the value of x



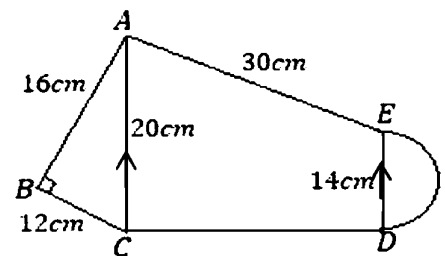
Part B

- Answer all the questions on this paper itself.

01. $\frac{2}{5}$ of the capacity of a water tank in a house, is filled with of a water from it $\frac{1}{2}$ was used for bathing and washing clothes. After that $\frac{1}{5}$ of the remaining capacity was used for watering to the flower plants.

- Find what fraction of the capacity of the tank that was used for bathing and washing clothes. (2 marks)
- Find what fraction of the capacity of the tank that was used for watering to the flower flower plants. (2 marks)
- Find what fraction of the capacity of the tank that was remained at last. (3 marks)
- If the remaining amount of water is 120l, find the capacity of the tank. (3 marks)

02. The following diagram shows a picture of a fish which was designed for an exhibition which will be gone to held at the end of a year. by a primary student. He hopes to point triangular part ABC by red colour the part ACDE by yellow colour and the semicircular part of diameter DE by green colour.



- Find the area of the part which will be hoped to point by red colour. (2 marks)
- If the area of the part ACDE, find the length of CD. (2 marks)
- If the pink colour ribbon is being going to paste around the figure, find the minimum length of the ribbon will be needed. (3 marks)
- The teacher advised to create another semicircular part of the diameter DE in the part ACDE and paint it by using green colour to beautify the picture. Draw this part on the above diagram and find the area of the remaining part which is hopes to paint by yellow colour.

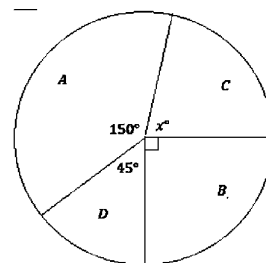
03.a) The value of a car which is being imported is Rs 2,000,000.00. The customs duty that has to be paid is 45% of the value of the item.

- i. Find the amount that has to be paid as duty. (2 marks)
- ii. What is the value of the car after the customs duty has been paid. (2 marks)
- iii. Rs. 10 000.00 is spent for travelling it to the show room and for the other expense. Now what is the value of the car. (2 marks)
- iv. If the profit percentage which is expected by the seller, is 25%, Find the value of the car that should be sold. (2 marks)

b) It makes 12 men 6 days to complete a certain task. If 4 female workers are needed to complete the part of the work which is done by 3 men, find the number of female works required to complete the above task. (3 marks)

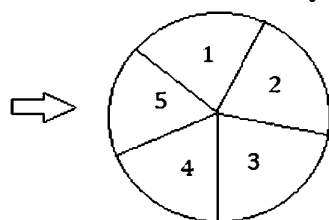
04. The relieving teams were used to help the people those who affected by the flood, in a affected area because of the heavy rain.

- A. The team of getting released the affected people.
- B. The team of preparing temporary boarding houses.
- C. The team of giving foods.
- D. The team of giving medical treatments.

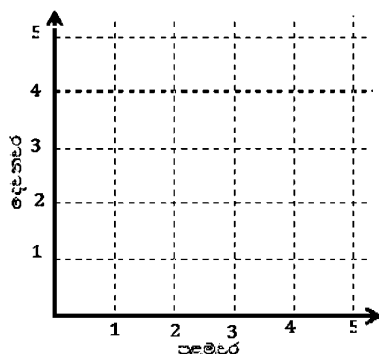


- i. For which work has been used most number of teams. (1 mark)
- ii. Find the angle at the centre of sector of the team of giving foods. (2 marks)
- iii. If there are 25 members in the team of giving foods, find the number of members in the team of getting released the affected people. (2 marks)
- iv. The part of the members from the members of the team of getting released the affected people, were joined with the team of preparing temporarily boading houses, temporarily for an emerency case. After that If the angle at the centre of the sector A is 120° find the number of members those who were jointed with the team of peparing temporary boarding houses. (2 marks)
- v. Find the total number of members those who were in the relieving teams. (2 marks)

05. A lucky circle which can be used to find your luck, is given in the figure. Based on the results which was taken by rotating it in twice by a person, the winner will be selected.



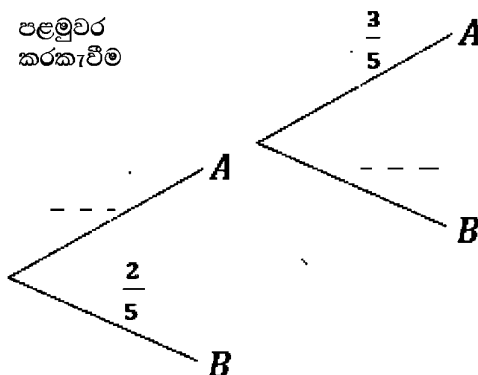
- I. Show the sample space of a participant in the given grid using 'x'. (2 marks)



- II. If participant can get same numbered in both two rounds, he can win. Encircle the above event on the grid and find the probability of it. (2 marks)

After the first five winners, A winner will be selected according to the events "getting even numbers in both rounds" or "getting odd numbers in both rounds" The uncompleted tree diagram is given below to present this random experiment. (A is used to represent the event getting odd numbers in both rounds" and B is used to represent the event "getting even numbers in both rounds")

- III. Extend the uncomplete tree diagram to the rotation of second round and write down their relevant probabilities. (3 marks)



- IV. From it, find the probability of the event "being a winner" (3 marks)



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Year End Term Test - 2017

Mathematics II

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Time : 3 hrs

- Answer ten questions selecting five questions from part A and five questions from part B.
- Each question carries 10 marks
- The volume of a right circular cylinder of radius r and height h is $\pi r^2 h$.

Part A

01. The assessed annual value of a certain house is Rs 100 000. The provincial council institution charges 15% of the value of the house as rates. The owner of the house has rented it and got one year advance amount. The monthly rent charged by him is Rs 7000. From this advance amount, he paid annual rate and spent Rs 29000 on maintenance. 25% of the remaining amount he left with him for his expense and he hopes to get Rs 40 800 at the end of three years by depositing the remaining amount in an institution which follows simple interest method. Find the annual simple interest rate that was charged? (10 marks)

02. An incomplete table to draw the graph of the function $y = 2x^2 - 1$ is given below.

x	-3	-2	-1	0	1	2	3
y	17	7	1	1	17

- a)i. Find the value of y when $x = 0$ and $x = 2$. (2 marks)
- ii. Using a suitable scale, draw the graph of the above function on a graph paper. (3 marks)
- iii. Write down, the minimum value of the function (1 mark)
- iv. Write down the equation of the function corresponding to the graph obtained when the above graph is moved upwards along the y axis by 4 units. (2 marks)
- b)i. Write down, using the graph, the roots of the equation $2x^2 - 1 = 0$ (2 marks)

- 03.a) Simplify, $\left(\frac{x}{x-3}\right) + \frac{3}{(3-x)}$ (2 marks)

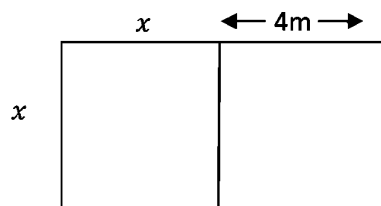
- b) The total daily wage of 7 male employee and 5 female employees is Rs 12900 in a certain work place. And also the total daily wage of 3 male employee and 10 female employee is Rs 12600.
- i. Taking the daily wage of a male employee as x and the daily wage of a female employee as y , construct two simultaneous equations. (2 marks)
- ii. Solve the two simultaneous equations and find the daily wage of a male employee and a female employee. (4 marks)
- iii. Show that "The daily wage of a male employee is Rs 300 more than the daily wage of a female employee" (2 marks)

04.a) Factorize, $k^2l^2 - mnl - k^2l + mn$

(3 marks)

- b) A large rectangular shaped flower bed of width 'x' m is separated into two parts such that a square shaped part and a rectangular shaped part of width 4m. The total area of above two parts is $12m^2$. According to the above information, take the quadratic equation $x^2 + 4x - 12 = 0$. By solving it, find the length and width of the flower bed.

(7 marks)



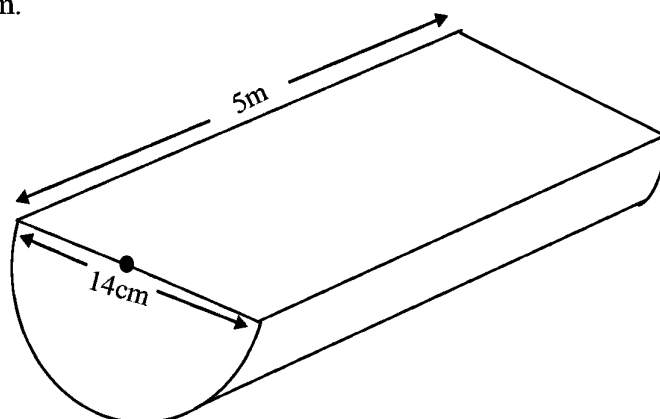
05. The following table contains information on the mass of 60 players those who are practicing a certain game.

mass (kg)	50-54	54-58	58-62	62-66	66-70	70-74
Number of players	6	15	16	13	7	3

- To which class interval does the greatest number of players belong? (1 mark)
- Taking the mid value of the class interval assumed mean, find the mean mass of the players. (6 marks)
- A group of 20 players from this players, decides to go a boat trip. If the mass that can be brought at one turn, is not exceeded 1000kg, can this group travel by boat at one turn. Explain your answer. (3 marks)

06.a) The diameter and height of a semi-cylindrical shaped rain ring are 14cm and 5m respectively. When it has been filled with water completely, find the height of the water level, after pouring the water in the semi-cylindrical rain ring to a cuboidal shaped tank of base area $500cm^2$ and height 1m.

(5 marks)



- b) Find the value, using logarithmic tables;

$$x = \frac{27.2 \times 135.1}{49.3}$$

(5 marks)

Part B

07. The way which is given marks according to a pattern to Nawodya who is going forward by avoiding game is given below.

For winning the first barrier - 15 marks

For winning the second barrier- 20 marks

For winning the third barrier - 25 marks

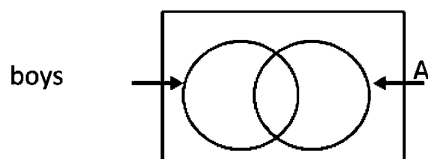
While she has won 10 barriers at present finding the marks which was got by her at 10th barrier, If she has another 15 barriers to complete the game show that the total marks which she can get from first barrier to last barrier is not exceeded 1880. (5 marks)

- b) If the first three terms of an arithmetic progression are x , $2(x - 1)$ and $3x - 4$. Show that the sum of 10th and 15th terms of this progression is $25x - 46$. (5 marks)

08. Use only a straight edge with cm/inm scale and a pair of compasses for the following constructions.

- i. Construct the triangle PQR such that $PQ = 6.8\text{cm}$, $\angle PQR = 45^\circ$ and $PR = 5\text{cm}$. (3 marks)
- ii. point 'O' is situated such that equidistant from P and R and $\angle QPO = 90^\circ$. Mark the position of point 'O'. (1 mark)
- iii. Construct a circle of center 'O' and radius OP. Extend PO to meet the circle at 'S' (3 marks)
- iv. By giving reasons, show that triangle PRS is an isosceles triangle. (2 marks)
- v. Measure and write down the length of PS. (1 mark)

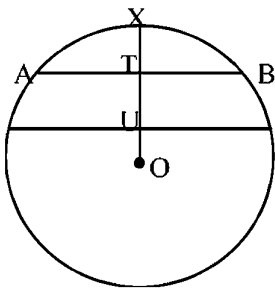
- 09.a) The information on the 80 students those who participated a trip of Laksirigama Maha Vidyalaya regarding the bathing of them during. The total number of students those who were bathing is 45.



- i. Suggest a suitable name for set A which is mentioned in the above Venn diagram. (2 marks)
 - ii. Include this information in a Venn diagram and find the number of girls those who were bathing. (2 marks)
 - iii. If the number of girls those who were not bathing is x , find the value of x . (3 marks)
- b) Assuming that only 40 boys participated for the above trip, Include the information about the bathing of them in a venn diagram and shade the region of "not bathing boys" (3 marks)

- 10.a) A straight edge of length 5cm has been drawn to represent a straight edge of length 50m in a scale diagram.
- Find the scale which has been used to draw the above scale diagram. (2 marks)
 - According to the above scale, find the actual length of a straight edge of length 25cm in the scale diagram. (1 mark)
- b) A balloon goes up 3m vertically from point 'O' within 1 minute. A child observes this balloon from point 'p' which is 15m away from point 'O' after 6 minutes. The point 'O' and 'P' are in the same horizontal.
- Draw a scale diagram using a suitable scale. (3 marks)
 - According to the scale diagram find the angle of depression of the child from the balloon. (1 mark)
 - Find the actual distance between the point 'O' and the another child who is on the point 'x' which has an angle of depression of 45° from the balloon which is in above from the ground after 6 minutes. The point 'O' and point 'x' are in the same horizontal ground. (3 marks)

- II.a) Prove that the theorem "The straight line joining the center of the circle to the midpoint of a chord is perpendicular to the chord". (5 marks)
- b) AB and PQ are two parallel chords of the circle with center O and the radius of the circle is 10cm. If $OX \perp PQ$, $AB = 12\text{cm}$ and $PQ = 16\text{cm}$, find the perpendicular distance between AB and PQ. (5 marks)



12. A regular pentagon ABCDE is shown in the following figure. In there AC and BE are intersected at F. By giving reasons find the magnitude of the following angles.

- $\angle \hat{A}B$ (1 mark)
- $\angle \hat{E}B$ (2 marks)
- $\angle \hat{E}D$ (1 mark)
- $\angle \hat{F}C$ (2 marks)
- Prove that EFCD is a parallelogram and write down a special name which we can used to call it.

