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Year End Term Test - 2017  
 Mathematics I

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Time : 2 Hrs

Part I

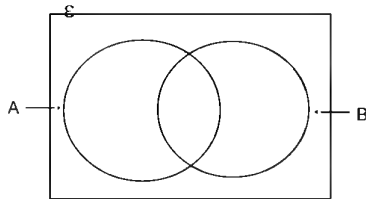
- Answer all the questions.

01. Underline the nearest value of  $\sqrt{34}$

I. 6 II. 5.8 III. 5.7 IV. 6.1

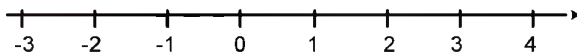
02. If Rs 7500 of rate is charged for a house which the assessed value is Rs 75000, find the percentage of tax.

03. Shade the region of the sub set  $A'$  in the venn diagram.



04. The perimeter of a semicircular lamina of radius 70cm is 360cm. What is the length of the arc?

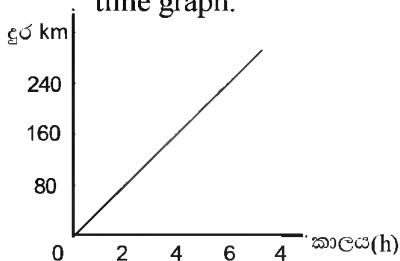
05. Solve the inequality  $2x - 3 \geq 1$  and show the solutions on the number line.



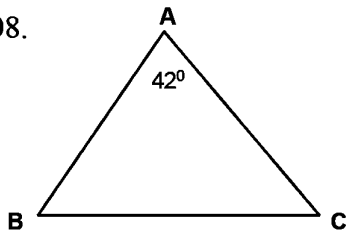
06. Write the suitable algebraic fraction for the blank.

$$\frac{3}{a} - \frac{\dots\dots\dots}{\dots\dots\dots} = \frac{5}{2a}$$

07. The motion of a motor car which is travelled in uniform velocity represents by the given distance - time graph.



08.

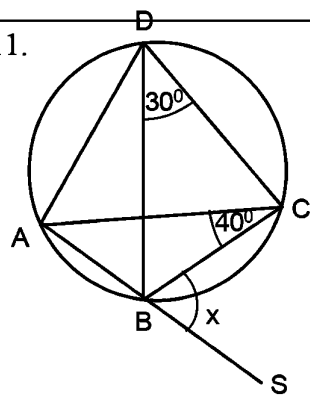


In the triangle ABC  $AB = AC$ , find the value of  $\hat{A}BC$

09. The probability which a person face with an accident is  $\frac{1}{7}$  and the probability of dead is  $\frac{1}{10}$ . Find the probability of a person met with an accident and save his life.

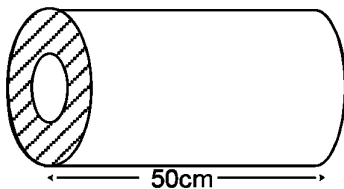
10. What is the heat common multiple of  $2a^2$  and  $3ab^2$

11.



Find the value of  $x$  in the diagram.

12. The shaded area of the cross section of the hollow cylindrical shape iron bar is  $116\text{cm}^3$  Find the volume of it.

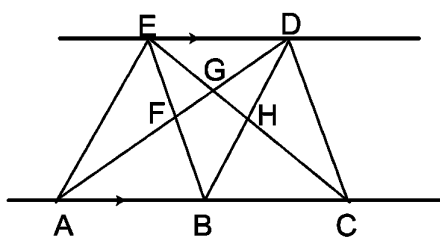


13. Find the value of  $x + y$  without solving the pair of equations.

$$2x + y = 13$$

$$x + 2y = 17$$

14. If  $AC \parallel ED$  name a triangle equal to the area of the triangle BHE

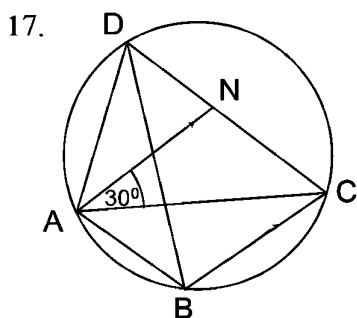


15. Write the equation of the straight line which passes through the points (0,3) and (1,4) according to the form of  $y = mx + c$

16. Following data distribution is arranged in descending order.

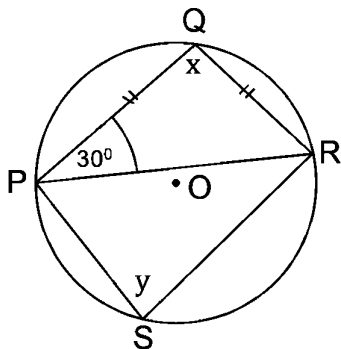
32, 30, 30, 27, 26, 26, 26, 25, 20, 18, 18

Find the inter quartile range of the distribution order.



ABCD is a cyclic quadrilateral. If  $AN \parallel BC$ ,  $\angle NAC = 30^\circ$ , Find the value of  $\angle ADB$ .

18. In the diagram  $PQ = QR$ . If  $\angle QPR = 30^\circ$ , Find the value of  $x$  and  $y$ .

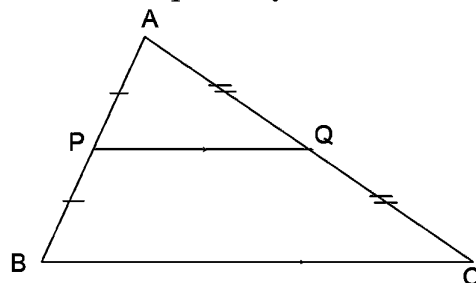


19. Express  $\log_3 1 = 0$  in index notation.

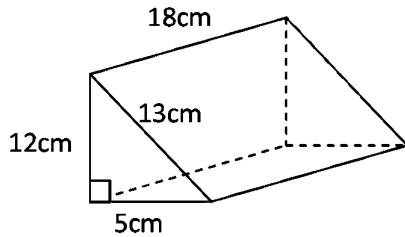
20. In the diagram  $PQ \parallel BC$ , P and Q are the mid points of AB and AC sides respectively.

If,  $PQ + BC = 24\text{cm}$

Find the values of PQ and BC separately.



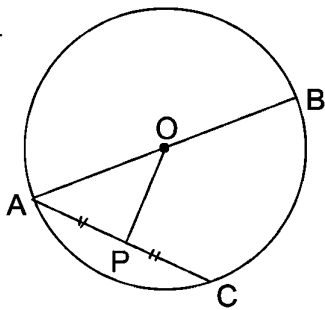
21. Write measurements of the rectangle which has the minimum area in the given prism.



22. Solve,

$$(x - 3)(x + 1) = 0$$

23.



In the circle with the center O.  $AB = 10\text{cm}$ ,  $AC = 8\text{cm}$  Find the length of OP.

24. A and B are two points a part from 8cm, using the knowledge of Loci.

I. Draw a sketch to show the locus of moving equidistance from the points A and B.

II. Show, how to find the points x and y on the above locus 6cm away from A. Indicate the measurements in the same diagram.

25. 4 men can dig  $\frac{1}{3}$  of a flute within 3 days. Find the total number of Monday needed to dig the whole flute.

Part B

01.  $\frac{5}{6}$  of a tank is filled with water. When 700l of water is used from it,  $\frac{1}{4}$  of tank is filled with water.

I. What fraction of volume of water is used from the capacity of the tank? (2 marks)

II. Find the capacity of the tank in l (3 marks)

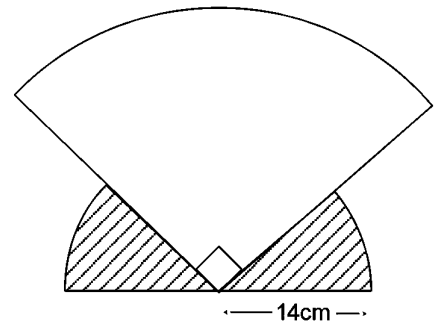
III. Find the remaining volume of water in the tank. (2 marks)

IV. The tank is filled completely by a pipe which flow the water of 10l per minute. Find the time taken to fill the tank. (3 marks)

02. A net of a decoration prepared by cardboard for notice board in the class room is given below. The radius of two shaded sectors is 14cm and central angle is  $45^\circ$ . The central angle of the other sector is  $90^\circ$

I. Find the perimeter of shaded parts. (2 marks)

II. Find the area of the shaded parts. (2 marks)



III. If the area of the large sector is  $462\text{cm}^2$  more than the sum of areas of small sectors. Write the ratio of areas of shaded parts and large sector in the simplest form. (3 marks)

- IV. Find the number of nets can be cut from a square shape cardboard which the side length is 60cm. Then find the area of remaining part of cardboard after cutting the nets. (3 marks)

03. The given incomplete table represents number of faulty drivers arrested by the police at a police check point.

Nature of the fault	No of drivers.	Angle of the sector
Harming liquor	40	$\frac{40}{120} \times 360 = 120^\circ$
without driving license	25	.....
Exceeding the speed limit	15	.....
without revenue license	20	.....
without insurance	20	.....

- I. What is the total number of drivers arrested? (1 mark)
- II. Fill in the blank of the table. (3 marks)
- III. Complete the pie chart using the above information. (4 marks)



- IV. If an amount of Rs 25000 is assessed as the minimum fine for the faults without having driving license, driving exceeding the speed limit, driving having liquor of for above three faults, find the total income received as the fine. (2 marks)

04. 4kg of paddy can be sold for Rs 35 just after harvesting the paddy. If paddy is stored and sold later the price of 1kg is Rs 40.

I. Mr. Senarath sells exact half of 5000kg of paddy just after the harvest. Find the income received by him. (2 marks)

II. Consider, when storing the paddy the weight of 2kg is reduced from 25 kg. Within 3 months. Find the income received by selling the remaining quantity of paddy after 3 months. (3 marks)

III. Find the profit or loss received by him without selling total quantity of paddy just after the harvest. (3 marks)

IV. If Mr. Senarath sells 1kg of paddy for Rs 40 then Rs 46 000 is kept from the income for his expenditure and the rest amount is deposited in a bank which is paid 8% annual simple interest, Find the total amount of money received by him at the end of one year. (3 marks)

05.(a) Consider the sets given.

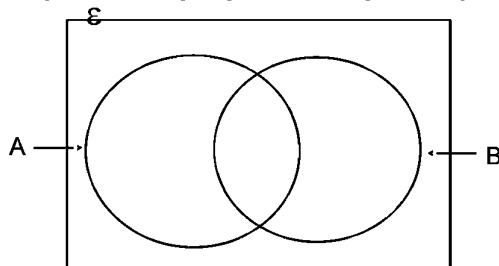
$$\varepsilon = \{1,2,3,4,5,6,7,8,9,10\}$$

$$A = \{2,4,6,8\}$$

$$A \cup B = \{2,3,4,6,8,9\}$$

$$A \cap B = \{6\}$$

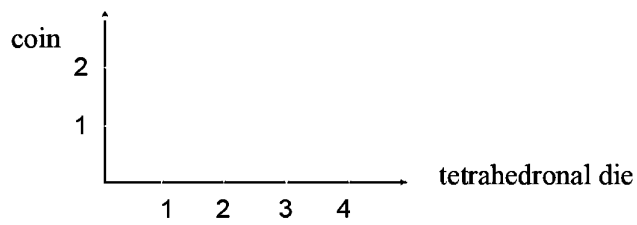
I. Include the above information in the ven diagram. (3 marks)



II. Write the elements of the set  $(A \cup B)'$  (1 mark)

b) An unbiased regular tetrahedron die which is numbered 1-4 on their faces and unbiased coin is tossed together.

I. Show the sample space of out comes on the grid. (2 marks)



II. Show the event, obtaining a number less than 4 of the die as A and obtaining tail of the coin as B on the grid. (2 marks)

III. Find  $P(A \cap B)$  (2 marks)





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Year End Term Test - 2017  
 Mathematics II

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Time : 3 Hrs

**Paper II**

**Part A**

- Answer 5 questions from part A and 5 questions from part B.
- Each question carries 10 marks.
- The volume of right circular cone is  $\frac{1}{3}\pi r^2 h$  when the radius of the base is r and right height is h.

01. I. The imported price of a harvesting machine is Rs. 2 000 000. Duty tax is 20%. It is sold for Rs 2 760 000 keeping a profit, find the percentage of the profit. (5 marks)

II. A farmer who bought the machine earned Rs 1 800 000 by working from the machine in one year. He sold it to another person by reducing the price by 40% from the buying price. Find the profit received by the farmer. (5 marks)

02. Answer following question with the graph of the function  $Y = -(x - 3)(x + 1)$

I. Find the value of y, when  $x = 0$ . (1 mark)

II. Write the co-ordinates of x , when the graph intersect the x axis. (2 marks)

III. Write the equation of symmetrical axis. (2 marks)

IV. Find the maximum or minimum value of the function. (2 marks)

V. By taking the scale, 10 small divisions of x axis and y axis as one unit draw the graph of the above function such that the graph passes the points. (-2,-5), (2,3),(4,-5) (3 marks)

03. a) The price of a 40 pages, square ruled or single ruled book is Rs 30. The price of a 80 pages, square ruled or single ruled book is Rs. 40

I. Show the price of a 40 pages and a 80 pages book by a matrix in the order  $1 \times 2$ . (1 mark)

II. Jayani buys 3 square ruled books and 6 single ruled book of 40 pages, and 4 square ruled books and 3 single ruled books of 80 pages. Represent above information in a matrix of  $2 \times 2$  arranging 40 pages books in the first row and 80 pages books in the second row.

(2marks)

III. Multiply the matrix of I and II above and find the price spent for square ruled books and single ruled books separately. (2 marks)

- b) Jayani paid Rs 550 to buy books by Rs 100 notes and Rs 50 notes. The number of 50 rupee notes are 2 more than number of 100 rupee notes.
- I. By taking number of Rs 100 notes as  $x$  and number of Rs 50 notes as  $y$  build up a simultaneous equation . (2 marks)
- II. Solve the above equation and find the number of Rs 100 notes and Rs 50 notes separately. (3 marks)

04. A frequency distribution of number of turns travelled by 40 vehicles which are transporting soil for constructing a road on a certain day is given below.

class intervals No of turns)	3-5	6-8	9-11	12-14	15-17	18-20
Frequency (No of vehicles)	3	4	6	9	13	5

- I. Find the number of vehicles traveled more than 14 turns. (1 marks)
- II. Find the mean number of turns traveled by a vehicle on that day. (5 marks)
- III. A vehicle can contain 4 soil cubes. If the price of a cube is Rs 2 500. Find the total cost spend for soil on one day. (1 mark)
- IV. 12 men involve to lay soil on a part of the road within 8 days with 8 hours per day. 12 men worked the first day but 10 men worked from the second day. If they work 8 hours per day, what is the number of days needed to complete the part of the road. (3 marks)

05. in a right cone of radius  $r$ , The height is 7 units more than the radius slant height is twice of the radius. Show that  $r = 7 \frac{(1+\sqrt{3})}{2}$ . Take  $\sqrt{3} = 1.73$  and find the radius to the nearest whole number. (10 marks)

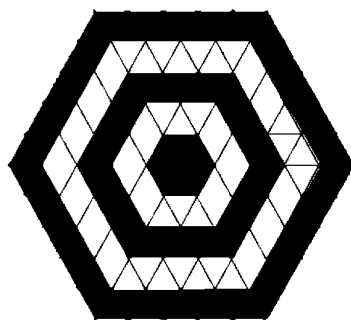
06. The diagram shows, how water is taken to purify in a housing scheme.

- A- well  
 B- Water purification center  
 C- The tank which distribute the water

- b) I. Show above information in a scale diagram by taking the scale, 10m by 1cm. (2 marks)
- II. According to the scale find the bearing of C from A and the real distance of AC. (2 marks)
- c) A ladder length of 4.5m is kept against to a wall at the point B and the ground at the point A. The angle between the ground and ladder is  $60^\circ$
- I. Draw a sketch of above diagram in your answer sheet and indicate above information. (1 mark)
- II. Find the height of CB to the first decimal place using the trigonometric tables. (2 marks)
- III. The ladder is kept by  $\frac{1}{2}$ m downwards from B due to the high inclination. Show the declination of the angle is  $10^\circ 56'$  (3 marks)

Part B

07. The diagram represents a stage background prepared by pasting white colour and black colour equilateral triangles. The first pattern is arranged by black colour 6 equilateral triangles.



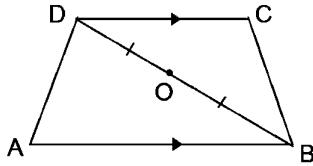
- I. Write the number of equilateral triangles in order of black, white, black, white of first four patterns. In which progressing they lie? (1 mark)
  - II. Find the number of triangular shape laminas in 8<sup>th</sup> pattern. (2 marks)
  - III. Find the total number of triangles used up to 15<sup>th</sup> pattern. (2 marks)
  - IV. If the length of a side of one equilateral triangular shape lamina is 20cm, find the perimeter of 15<sup>th</sup> pattern in meters. (2 marks)
- b) In a geometric progression 2<sup>nd</sup> term is 6 and fifth term is 48. Find the common ratio of the progression. (3 marks)

08. Do the following construction by using cm/mm scale, straight edge and a pair of compasses the construction lines clearly.

- I. Draw the triangle ABC such that  $AB = 5\text{cm}$ ,  $\hat{A} = 60^\circ$  and  $\hat{B} = 45^\circ$ . (3 marks)
- II. Draw a circle which touches the extended sides AB, AC and the side BC with center O. (3 marks)
- III. Produce the side AB to such that  $BD = 6\text{cm}$ . Construct a tangent to the circle from D except BD. (2 marks)
- IV. Name the intersection point of above III tangent and extended AC as E. (1 mark)
- V. How do you name the circle drawn above respect to the triangle ADE. (1 mark)

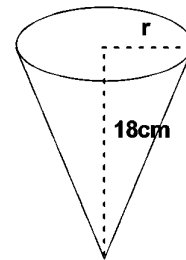
09. Three vertices of the triangle ABC lie on a circle such that the tangent drawn at C meets the extended AB at D. R lies on the line DA ( $DR > DB$ ) such that  $DR = DC$ . Include the above information in a diagram and take  $\hat{DCB} = a$ . Name an angle equal to  $\hat{DCB}$ . prove that  $\hat{BCR} = \hat{RCA}$ . (Hint- join C and R) (10 marks)

10. ABCD is a trapezium.  $AB \parallel DC$  and the length of AB is twice the length of DC. O is the midpoint of the diagonal DB. When extend the line CO, it meets AB at E.



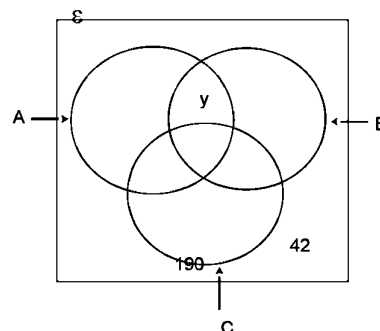
- I. Copy this diagram in your answer sheet and prove that  $\triangle DOC \cong \triangle EOB$  (4 marks)
- II. Prove that BCDE is a parallelogram. (2 marks)
- III. Draw a line parallel to DC from O and mark the point it meets CB as F. Show that  $OF = \frac{1}{4} AB$  (4 marks)

11. A conical shape glass of base radius 6 cm and height 18cm is kept downwards and it is filled with water.



- I. Show that the volume of water in the glass is  $6\pi\gamma^2 \text{ cm}^3$  (4 marks)
- II. An amount of  $\frac{\pi\gamma^2}{2} \text{ cm}^3$  is wasted when the volume of water in the above glass is poured in to cuboid shape vessel which the base is a square of side length  $a$  cm. If the remaining amount is filled up to  $h$  cm, show that  $a^2 = \frac{\pi\gamma^2}{2h}$  (2 marks)
- III. When  $11\pi = 34.5, \gamma = 5.76, h = 9$  Find the value of  $a^2$  by using logarithmic tables to the nearest whole number. Then find the value of. (4 marks)

12. In a mixed school the total number of students of grade 10,11 classes is 470, 239 of them are girls. 190 students study Tamil. 217 students study information technology. 95 girls study Tamil. 81 girls study information technology and Tamil. Copy the diagram to your answer sheet and include data for answering the problems.



- I. Describe the sets A and B. (2 marks)
- II. Describe region represented by 42 (1 mark)
- III. Describe the region represented by  $y$  in words and find the value of  $y$ . (4 marks)
- IV. Find the number of girls who do not study both subjects. (1 mark)
- V. Express the number of boys who do not study Tamil from total number of students as a percentage. (2 marks)