Second Term Test - 2017

Mathematics I

Grade
11

පාසලේ නම :- ....

ඇතුළත්වීමේ අංකය :- .... Time: 2 hrs
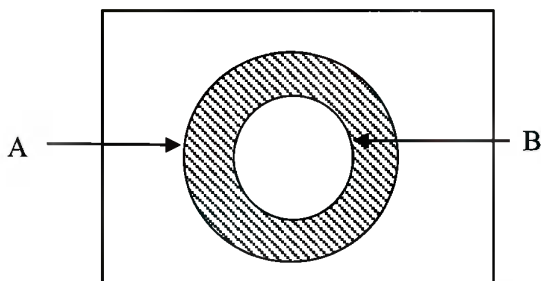

Part A

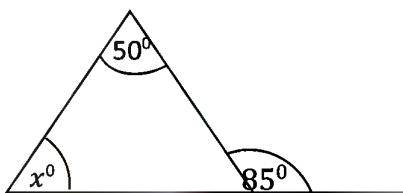- Answer all questions here itself

---

01. Find the value of $\sqrt{12}$ to the first approximation.

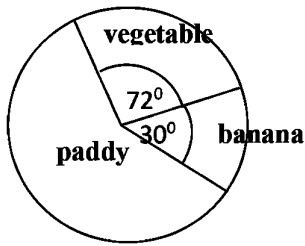02. Simplify, $\dfrac{1}{3x} + \dfrac{2}{x}$

---

03. Express the shaded region in set notation.

---

04. Find the value of x according to the information in the figure.

05. The given pie chart represents how a farmer separates his land to grow paddy banana and vegetables. What percentage of the land separated for vegetable from the whole land.

06. Express $3 = 10^{0.4771}$ in logarithmic form.

07. Solve the pair of simultaneous equation form.
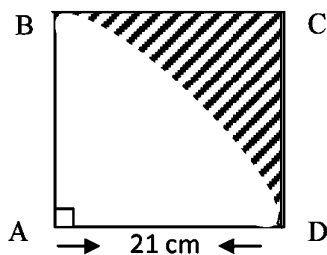$$a + 3b = 6$$
$$2a + 3b = 9$$

08. The goals taken by a football team by facing 7 matches are given below.
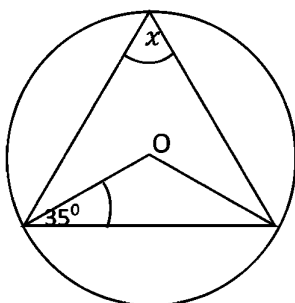
4, 3, 3, 2, 1, 1, 0   What is the number of matches that goals are taken exceeding the median number of goals.

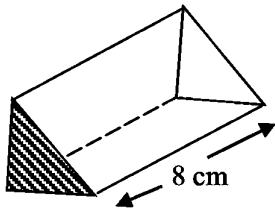09. The length of a side of the square ABCD is 21cm. Find the perimeter of the shaded region.

10. 0 is the center of the circle. Find the value of x according to the information in the figure.

11. According to the information of a random experiment, In an event $A, n(A) = 3, n(S) = 7$. Find $P(A)$.

12. The shaded area of the prism is $50 cm^2$ and length of the prism is $8 cm$. Find the volume of the prism.

    8 cm

13. Find the number of men needed to complete a work in 8 days. Which twice of the work done by 12 men within 3 days.

14. Factors of $6x, 3x^2$ and $4x$ are given below.
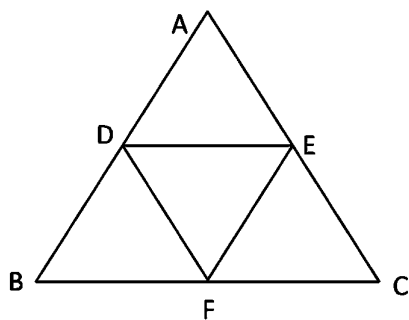
$6x \longrightarrow 2 \times 3 \times x$

$3x^2 \longrightarrow 3 \times x \times x$

$4x \longrightarrow 2 \times 2 \times x$

Find the L.C.M of $6x, 3x^2$ and $4x$

15. If $x^2 + 3x - 10 = (x + a)(x - b)$ find the value of a and b

16. The mid points of AB, AC and BC are D , E and F respectively. According to the information above put √ sign × or sing in the table.

Perimeter of the triangle ABC = 2× perimeter of the triangle DEF	
AB = BC	
AC = 2DF	

17. $\dfrac{5}{x} \div \dfrac{15y}{2}$ simplify

18.

(i)	(f)
1 - 6	3
7 - 12	2

A group frequency distribution is given above. Re-arrange the class intervals with class boundaries to draw a histogram.

Class intervals with class boundaries(i)	f (frequency)
	3
	2

19.   The right circular cylinder which the area of bottom surface is $154 cm^2$ is filled exact half of the the height (h) with water. Volume of water is 924 cm^2 . Find the total height (h)

h
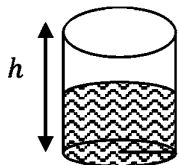
20.   OM is drawn perpendicular to the chord AB in the circle which the center is O. OM = 3cm and AB = 8cm. Find the radius of the circle.

O

3 cm

B

A   M
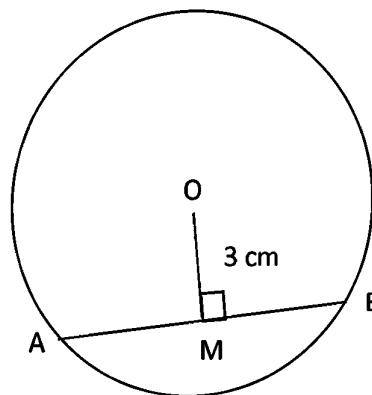
21. Gradient (m) of the given straight line is $(-\frac{1}{2})$. In the straight line.

   I.   Find the intercept (c)

   II.   Write the equation according to the form of $y = mx + c$
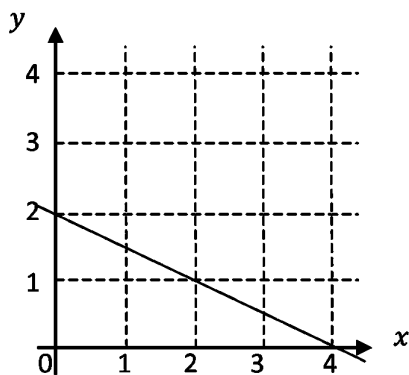
22. The length of the given rectangle is twice it's breadth. If the area of the rectangle is $50cm^2$, Find its length.
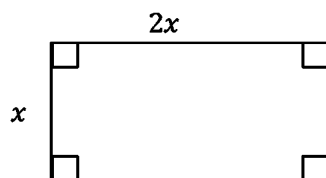
23. In the progression 2, 6, 18............

   I.   What is the common ratio.

   II.   write 12th term according to the form of ar^{n-1}

24. Mark the point P in the diagram by a rough sketch such that equidistance from AB and AC, and 5cm away from A and inside $B\hat{A}C$ obtuse angle.

25. Value of $'a'$ is 25% of the value of b. Express the value of $^a/_{8b}$ as a fraction in the simplest form.

Part B

- **Answer all qnestions here itself.**

01.   Sirisoma sold $\frac{1}{5}$ of harvest in the last season to a seller and settled the cost of harvesting using
That income. In the remaining harvest $\frac{1}{8}$ is saved to consume , and the rest is sold to
Paddy Marketing Board

    I.   After selling the harvest to a seller, what is the remain amount as a fraction of whole
harvest.   (2 marks)

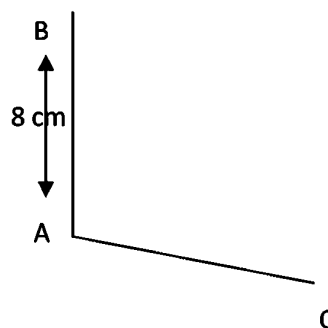   II.   What is the fraction of harvest consumed.   (2 marks)

    III.   What is the fraction of harvest sold to Paddy Marketing Board.   (2 marks)

    IV.   If Sirisoma saved 400kg of paddy to consume. Find the amount of paddy sold to paddy
marketing board.   (2 marks)

    V.   If the received Rs. 117 600/= from paddy marketing board, Find the price of 1kg of paddy
sold   (2 marks)

02.   Sunimal obtained a loan of Rs. 25 000 from Ranjith at the annual simple interest rate of 8%.

    I.   Calculate the total interest to be paid after 3 years.   (2 marks)

    II.   Find the total amount to be paid to settle the loan.   (2 marks)

III. Sunimal invested the loan to buy shares when the dividend income per share is Rs. 5. The market price of a share is Rs. 50. Find the total dividend income received by him after 3 years.   (3 marks)

IV. He decides to settle the loan after 3 years by the dividend income and by selling the shares. What should be the selling price of a share.   (3 marks)

03.   The given rough diagram represents a children park with measurements. There is a semi circular flower bed at one end. The remaining area is kept to grow grass.
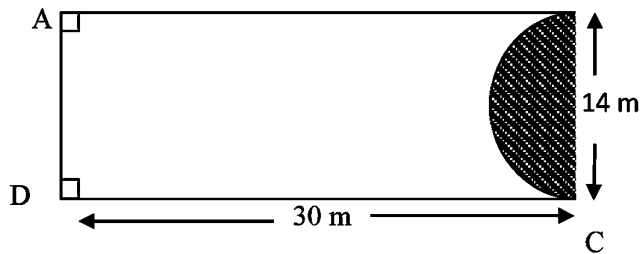
I.   A fence is to be fixed around the flower bed. Find the minimum length of the fence.
                                                                                      (2 marks)

II.   Find the area except the flower bed.   (4 marks)

III. The cost for growing grass is Rs. 250 per $1 m^2$. Find the total cost spend to grow grass.
                                                                                      (2 marks)

IV.   A rectangular shape part which is equal in area of the semicircular flower bed, is to be joined at the other end of the children's park draw it in the diagram with measurements.

(2 marks)

04.(a) The probability of germinating of a certain kind of seed is $\frac{9}{10}$. Saman try to germinate 2 seeds from them. An incomplete tree diagram showing the results of germinating and not germinating is given below.

I.   Complete the tree diagram   (3 marks)

1st seed   2nd seed

.... .germinating

.... germinating

- - - - - - - not germinating

$\frac{1}{10}$ not germinating - - - - - - -   germinating
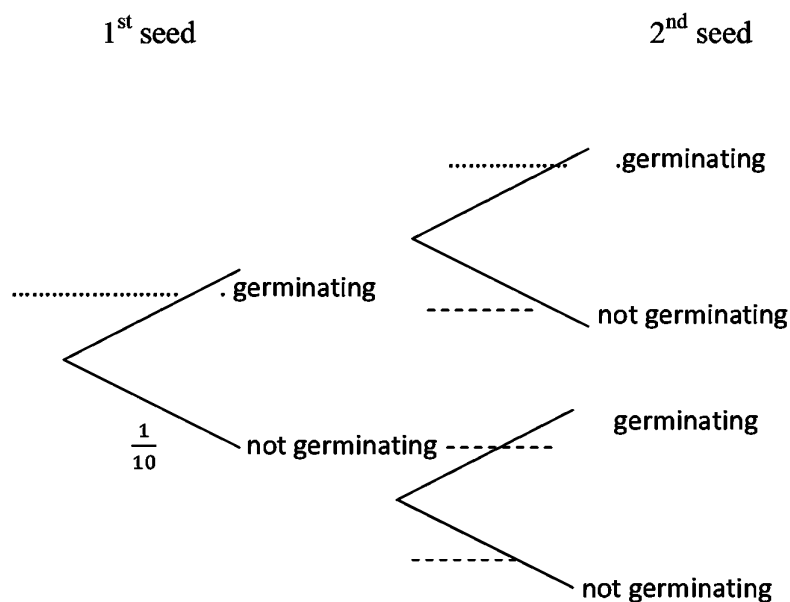
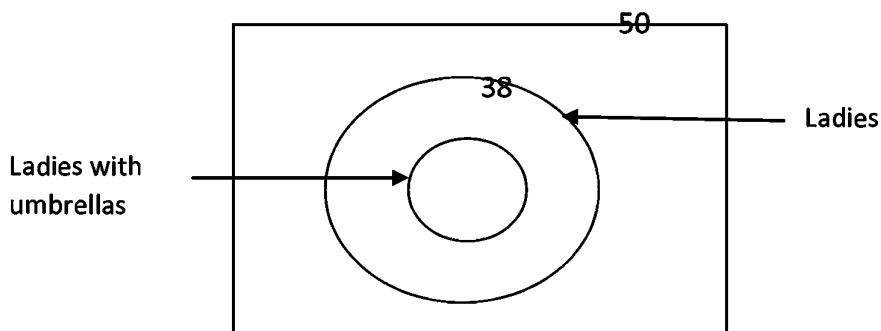- - - - - - - not germinating

11. Find the probability of germinating at least a seed using a tree diagram.   (2 marks)

(b)   There are 50 passengers in a bus holt 38 of them were ladies, 12 passengers out of ladies have umbrellas .

I.   An incomplete Ven diagram is given below complete it.   (3 marks)

50

38

Ladies

Ladies with umbrellas

II.   Find the number of gents in the bus halt without having umbrellas.   (2 marks)

05.   An uncompleted frequency distribution and uncompleted histogram, by collecting the information of selling water melon during a certain month are given below.

(0-20 class interval represents, the amount greater than 0 or equal but less than 20)

Number of water melon	0-20	20-40	40-60	60-80	80-100
number of days	4	....	10	7	………..
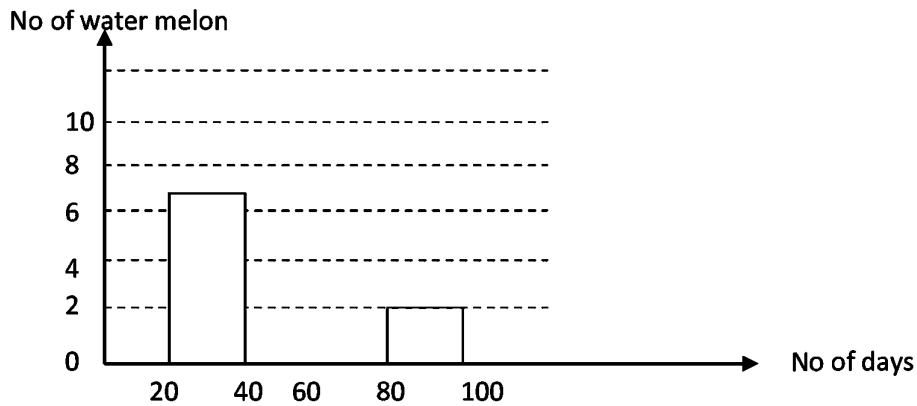
I.   Fill in the blanks of the table using the histogram.   (2 marks)

II.   Complete the histogram using the table.   (3 marks)

III.   What is the class interval which represents highest number of days.   (2 marks)

IV.   Express the number of days which sold more than 60 water melons as percentage from the total number of days.   (3 marks)

Second Tcrm Test – 2017

Grade
11

Mathematics II

පාසලේ නම   :- ....
ඇතුළත්වීමේ අංකය :- ....

Time: 3hrs

Paper II

- 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 $\pi r^2 h$.
- The volume of a right circular cone of radius r and height h is $\frac{1}{3}\pi r^2 h$.

Part A

---

01.   A refrigerator priced at Rs 40 000 for outright purchase can be bought by making a down payment of $\frac{1}{10}$ from outright purchase and paying the rest in 3 years in equal monthly installments. If a 24% annual interest rate is charged on the loan, where the interest is calculated on the reducing loan balance, find the amount of a monthly installment.

(10 marks)

---

02.   An incomplete table prepared to draw the graph of the function $y = 3 - x\,(x + 2)$ is given below.

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

i.   Fill in the blank of the above table.   (1 mark)
ii. Using the scale of 10 small divisions as one unit along the x- axis and along the y- axis, draw the graph of the above function on a graph paper.   (3 marks)
iii. Find the maximum value of the function for which x is $0 \le x \le 1$ (2 marks)
iv. Write down the given function in the form $y = -(x + p)^2 + q$ and write down the values of $p\ and\ q$ (2 marks)
v.   Using the graph, find the positive value of x such that $x\,(x + 2) = 3$.   (2 marks)

---

03. The following frequency distribution is prepared from the information on the number of certain types of milk packets which were sold by a sales man to 30 shops on a certain day.

Number of milk packets	1-5	6-10	11-15	16-20	21-25	26-30	31-35
Number of shops	1	2	7	9	6	3	2

    I. Write down the class interval of the number of milk packets which were sold for the highest number of shops. (1 mark)

    II. Using a suitable assumed mean or otherwise, Find the mean number of milk packets bought by a shop to the nearest whole number. (5 marks)

    III. Find the total number of milk packets that can be expected to be given these shops in such four times. (2 marks)

    IV. A certain amount of commission is given to the sales man for selling a milk packet. If he got Rs. 22800.00 as a total commission for selling milk packets for shops in such 4 times, Find the commission for a milk packet.
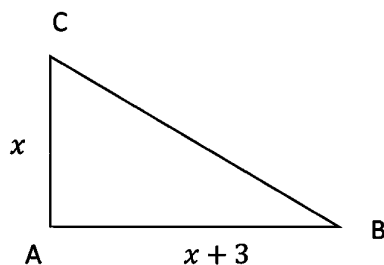
(2 marks)

04. The angle of elevation of the top of a communication pillar from the point A is 40^0. The observer travels a distance of 12m along a straight path towards the communication pillar and reaches the point B. The angle of elevation of the top of the communication pillar from the point B is 60^0

    i. Using a scale of 1cm to 3m, draw a scale diagram to represent the above data. (Ignore the height of the observer.) (5 marks)

    ii. According to the scale diagram, find the actual height of the communication pillar.

(2 marks)

    iii. If a taut wire length of 21m is fixed from point B to the pillar, Mark that fixed point on the pillar as 'D' and Find the actual distance from top of the pillar to the point D.

(3 marks)

05. Manuja opened his till and took out 'a' number of Rs 2 coins and 'b' number of Rs 5 coins. The total amount of all the coins which were taken out, is Rs 121. When he was going to exchange the above coins into the notes, three Rs 5 coins were misplaced. After giving the remaining coins to the owner of the shop, he said that "The total number of coins is 29 in there"

a) i. By constructing a pair of simultaneous equations and solving them, Find the number of Rs 2 coins and Rs 5 coins in the till separately. (5 marks)

ii. Find the maximum number of Rs 20 notes that can be taken for the amount of money given to the owner of the shop by Manuja. (2 marks)

b) Expand and simplify, $(2x - 3)^3$ (3 marks)

06. In triangle ABC, the lengths of two sides are given according to the ' x '. The length of the hypotenuse is 1cm less than the twice of the length of the smallest side.

i. Find an expression in terms of ' x ', for the length of the hypotenuse. (2 marks)

ii. Show that the length of the hypotenuse is 10.4cm (Take $\sqrt{41} = 6.4$ cm) (8 marks)

Part B

07.a) The sum of first n terms of an arithmetic progression is given by 2n(n+2)

i. Find the sum of first 20 terms. (2 marks)

ii. Find the first three terms of this progression. (3 marks)

iii. Find the 7th term. (2 marks)

c) Find the 7th term of the geometric progression with first term -12 and common ratio 2. (3 marks)

08. Use only a straight edge with a cm/mm scale and a pair of compasses for the following constructions. Show the construction lines clearly.

    I.   Construct a circle of diameter AB and AB = 10cm   (2 marks)

    II.   Mark point ' C ' on the circle such that AC = 8cm   (1 mark)

    III.   Complete the triangle ABC and write down the length of BC by measuring. (2 marks)

    IV.   Find the point ' D " on the circle such that AD = BD and construct the quadrilateral ACBD.

                                                                         (2 marks)

    V.   Find the area of the quadrilateral ACBD.   (3 marks)

09.
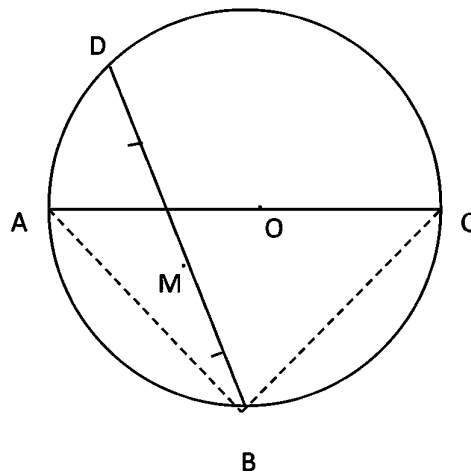
The points A, B, C and D lie on the circle of Centre 'O'. The midpoint of BD is M. When MO is produced, CD meets it at P. Copy the diagram into your answer sheet and mark all the information in it. Name an angle equal to $P\hat{M}D$ from triangle ABC and prove that $A\hat{C}B = D\hat{P}M$.

                                                                                  (10 marks)

10. In triangle ABC, the midpoint of BC is D. The line drawn from D parallel to AC meets AB at E. The line drawn from E parallel to BC meets AC at F.
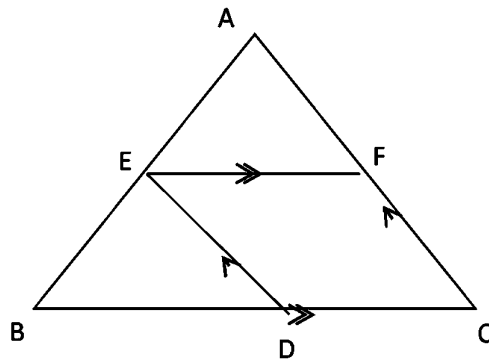
I.   Prove that AE = BE   (3 marks)
II. Prove that AF = FC   (2 marks)
III. Prove that $A\hat{E}D = A\hat{B}C + A\hat{C}B$ (5 marks)

11. i.   Express the volume of a right circular cylinder of base radius 2r and height of it is three times base radius, in terms of r.   (2 marks)

    ii. If a right circular cone of radius 2r and height 3r is removed from the above mentioned cylinder such that given in the following figure, show that the volume of the remaining part of the cylinder is $8\pi r^3$ (4 marks)
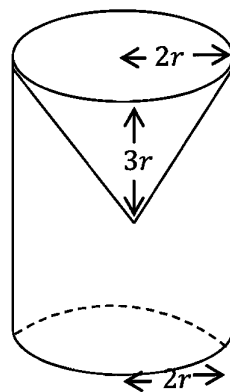
    iii. When $\pi = 3.14$ and r = 0.75cm, find the volume of the remaining part of the cylinder using logarithmic table.   (4 marks)

12. a) From 100 members of sports club, 60 are boys and 40 of them like cricket. The number of girls who like cricket is 34.

    i.   Represent this information in a Venn diagram.   (5 marks)
    ii.   How many girls do not like cricket?   (1 mark)

   b) After few times, 20 new members joined to this sports club. From them 12 are boys and 8 are girls. All the girls in the club come forwarded to cricket and12 new boys come forwarded to other games without cricket.

    i   Prepare a Venn diagram again according to the above information, Find the number of elements belonging to each regions and write down them in the relevant regions

                                                                               (4 marks)