

බස්නාහිර පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව மேல் மாகாணக் கல்வித் திணைக்களம் Department Of Education – Western Province	<b>බස්නාහිර පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව</b> <b>மேல் மாகாணக் கல்வித் திணைக்களம்</b> <b>Department Of Education – Western Province</b>	පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව ව கல்வித் திணைக்களம் மேல் மாகாணக் கல்வித் தி Department Of Education – Western Province Dep පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව ව கல்வித் திணைக்களம் மேல் மாகாணக் கல்வித் தி Department Of Education – Western Province Dep
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**දෙවන වාර ඇගයීම**  
**முதலாம் தவணை பரீட்சை - 2018**  
**Second Term Evaluation**

ශ්‍රේණිය - தரம் <b>11</b> Grade	විෂයය பாடம் } <b>Mathematics</b> Subject	පත්‍රය வினாத்தாள் } <b>II</b> Paper	කාලය காலம் <b>3 hours</b> Time
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**Important:**

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

**Part A****Answer 5 questions only.**

1. A mobile phone worth Rs. 30 000 can be purchased by making a down payment of Rs. 12 000 and paying the remainder by 15 equal monthly installments with an annual interest rate of 36%. If the interest is calculated on the reducing balance, calculate the value of a monthly installment.
2. An incomplete table of values prepared to draw the graph of the function  $y = 1 + 2x - x^2$  is given below.

$x$	-2	0	1	2	3	4
$y$	-7	-2	.....	1	-2	-7

(a)

- i. Find the value of  $y$ , when  $x=1$ .
- ii. Draw the graph of the above function using a suitable scale.

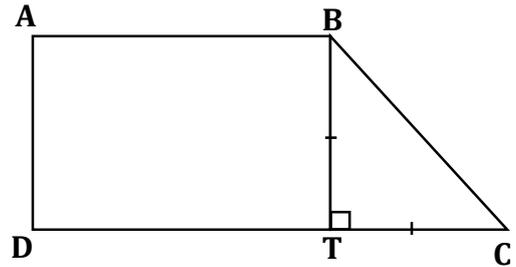
(b) Using the graph,

- i. Write the equation of the axis of symmetry.
- ii. Write the equation of the graph in the form  $y = -(x - a)^2 + b$ .
- iii. Find the positive root of the equation  $x^2 - 2x - 1 = 0$

3. (a) Simplify.  $\frac{x+1}{y} \div \frac{2(x+1)}{x}$

(b) A certain group of children bought some apples. When all apples are cut into 4 equal pieces and divided one piece for each child, 3 pieces remained. When all the apples are cut into 3 equal pieces and divided one piece for each child, there was a short of 2 pieces. By taking the number of children as  $x$  and the number of apples as  $y$ , build up a pair of simultaneous equations and find the number of children and the number of apples.

4. Figure shows ABCD trapezium shaped metal sheet.



i. By taking the AD length as  $x$  meters, express the TC length in terms of  $x$ .

ii. If the DC length is 2 meters more than the twice of the AD length, express the DT length in terms of  $x$ .

iii. BTC right angle triangular portion is removed from the ABCD metal sheet. Write an expression for the area of the remaining portion, in terms of  $x$ .

iv. If the area of the remaining portion is  $5m^2$ , show that  $x = -1 \pm \sqrt{6}$ .

v. When  $\sqrt{6} = 2.4$ , show that the area of the whole metal sheet does not exceed  $6m^2$ .

5. A vertical telephone post is situated in an inaccessible location. The angle of elevation of the highest point of the post from the point X in the horizontal ground is  $50^\circ$  and the angle of elevation of the highest point of the post from a point 40m away to the post than X is  $35^\circ$ .

i. Draw a sketch diagram with relevant measurements using the above information.

ii. Using the scale 1: 1000 (1cm  $\rightarrow$  10m), draw a scale diagram.

iii. Using the scale diagram, find

(a) The height of the post.

(b) The distance from X to the foot of the post.

6. The information collected about 60 employers who came late during a certain day in a company is given below.

No of minutes they got late	0 - 4	4 - 8	8 - 12	12- 16	16 -20	20- 24	24- 28	28- 32
No of employers	5	6	8	10	12	8	7	4

(0 – 4 means greater than or equal to 0 and less than 4)

i. What is the maximum time that an employer may have got late?

ii. Using a suitable assumed mean or using another method, find the mean time in minutes that an employer gets late.

iii. If there are 20 working days in a month and there are 186 employers working in the company, how many hours did the company lose during the month?

iv. If the company pays Rs. 240 per hour for an employer, show that the amount lose by those employers does not exceed Rs. 240 000.

**Part B**

**Answer 05 questions only.**

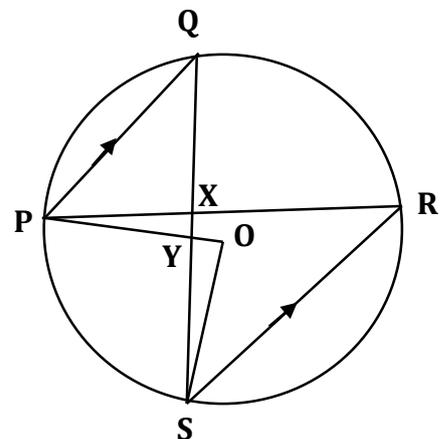
7. In a certain part of a pandol light bulbs are connected to circular frames in equal distance. The bulbs are connected in such a way that in the first frame there are 16, in the second frame there are 20, in the third frame there are 24 and so on.
- When the number of light bulbs in the frames are taken as terms of an arithmetic progression, how many light bulbs are there in the 10<sup>th</sup> frame?
  - If there are 76 light bulbs in the last frame, how many circular frames are there in that part of the pandol?
  - If there 3 such parts in the pandol, Seneth says that the number of light bulbs needed for it is 2000. Do you agree with his statement? Give reasons.

8. Using only a straight edge and the pair of compasses do the following constructions.
- Construct the triangle ABC, where  $AB = 5\text{cm}$ ,  $AC = 6\text{cm}$  and  $\hat{CAB} = 90^\circ$ .
  - Construct the bisector of  $\hat{CAB}$  and name the intersection point of the bisector and BC as D.
  - Construct a perpendicular to AB from D and name the intersection point of the perpendicular and AB as E.
  - Construct a circle with the center D and the radius AD.
  - Show that  $AE = ED$ , without measuring the length.

9. In the isosceles triangle ABC,  $AB = AC$ . The mid point of AB is D. The side AC is produced to F such that  $DB = CF$ . DE is parallel to BC. The lines BC and DF meets at G. Mark the given information on a sketch diagram and show that  $GC = \frac{1}{4} BC$ .

10. P, Q, R and S are points on the circle with the center O. the chords PQ and SR are parallel to each other. The lines QS and PR intersect at X and the lines QS and PO intersect at Y. show that,

- $\hat{POS} = \hat{PXS}$
- The triangles PQX and XSR are equiangular.
- $\hat{POS} = 2 \hat{QPX}$
- Hence, name two isosceles triangles.



11. A solid metal cylinder with the radius  $a$  and the height  $6a$  is melted and 20 solid metal cones with the radius of the base  $r$  and the height  $2a$  are made without wasting any metal. Show that  $r = \frac{3a}{\sqrt{20}}$ .  
When  $a = 3.25$ , using the logarithmic tables find the value of  $r$ .

12. (a) If  $n(A \cup B) = 40$ ,  $n(A) = 27$  and  $n(B) = 28$ , find  $n(A \cap B)$ .

(b) Both Vishwa and Ridma use public transportation to go to their work places. The probability of Vishwa getting late for work is  $\frac{1}{5}$ . The probability of Ridma getting late for work is  $\frac{1}{3}$ . Depict the relevant sample space in a tree diagram. Hence find the probability of,

- i. Both not getting late for work.
- ii. Only one getting late for work.
- iii. Who has the highest possibility of getting late for work. Give reasons.