Education Zone - Negombo

2nd Term Evaluation - 2015

Mathematics

Index No. .....

Grade 10	Paper II	Time: 2½ Hours

Instructions

- Select **05** questions from **A** and another **05** from part **B** and answer **10** questions.
- 10 marks for each question.

Part A

01. a. A certain municipal amends the assessing values of properties and the percentages of rates (assessment tax) every 5 years within the limits of their council An 8% of annual assessment tax is charged for a house with the assessed annual value of Rs. 50 000, which lies within the limits of that municipal council.

i. Calculate the rates (Assessment tax) that have to be paid for a year for the above house. (2 Marks)

ii. If the assessed value of the house was increased by 10% after the amendment, calculate the new assessed value of the house. (2 Marks)

iii. If the amended assessed value was increased by Rs. 1500 than earlier, find the amended percentage of rate. (2 Marks)

b. A person who imports vehicles pays a custom duty of 30% for a vehicle worth Rs. 900 000. Another Rs. 50 000 is spent as extra expenses. Finally he decides to sell it by keeping a profit of Rs. 150 000. Find the targeted selling price of the vehicle. (4 Marks)

02. An incomplete table with x and y values is given below to draw the graph of the function $y = 5 - 2x^2$

x	-3	-2	-1	0	1	2	3
y	-13	.....	.....	5	3	.....	.....

i. Find the values suitable for the blanks. (2 Marks)

ii. By taking the scale as ten small squares as one unit along the x-axis and ten small squares as two units along y-axis, draw the graph for the above function. (3 Marks)

iii. Write the equation of the axis of symmetry. (1 Mark)

iv. Write the co-ordinates of the maximum point. (1 Mark)

v. Make x the subject of the given equation above ($y=5-2x^2$). By substituting a suitable value for y, find the value of $\sqrt{5}$ (3 Marks)

03. a. i. Factorise $6x^3 - 3x^2y - 9xy^2$ (3 Marks)

ii. Solve the simultaneous equations given below (2 Marks)

$2x - y = 6$

$x + 3y = 7$

b. The length of a rectangle is $(x + 4)$ cm and its breadth is $(x - 1)$ cm.

i. Build an algebraic expression for the area of the rectangle in terms of x. (1 mark)

ii. If the area of the rectangle is 14 on^2, build a trinomial equation including x. (2 marks)

iii. By solving the above trinomial quadratic equation, find the suitable value for x. (2 marks)

04. a. Find the value.

i. $3\log_{10}2 - \log_{10}12 + \log_{10}6 + 2\log_{10}5$ (2 marks)

ii. $\log_4 32 + \log_4 2$ (2 marks)

b. $\log_a x - \log_a 3 = \log_a 2 + \log_a 5$; Solve. (2 marks)

c. By using the logarithmic tables, solve : $\frac{182.3 \times 2.567}{49.81}$ (4 marks)

05. a. A plaster is made by mixing cement and sand to the ratio 1:6.

i. What is the fraction of the cement in the mixture? (1 mark)

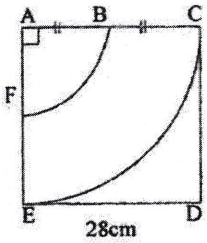
ii. How many pans of cement should be mixed with 24 pans of sand? (2 marks)

iii. A bag of cement contains 10 pans of cement. Find the number of pans of sand that should be mixed with the above 10 pans of cement in the bag. (1 mark)

iv. Find the number of pans of cement and sand separately to make 105 pans of plaster mixture. (2 marks)

b. To complete a certain piece of work, 4 men need 5 days. After working in the first two days, they could not work the following day due to the heavy rain.
Find the number of extra men needed to complete the work in the remaining 2 days. (4 marks)

06. The figure shows a metal frame which was made to fix for a window.



i. Name the shape ACE with the center A and the radius AC. (1mark)

ii. Find the length of BF. (2 marks)

iii. Find the total length of the metal frame. (3 marks)

iv. Find the area of the region covered by BCEF. (4 marks)

Part - B

07. a. Consider the number pattern given below.

7, 10, 13, 16, ...

i. Find the general term of it. (2 marks)

ii. Find the 21st term. (2 marks)

iii. Which term is 79? (2 marks)

iv. Is 125 a term of it ? Give reasons. (2 marks)

b. Find the first 2 terms of the number pattern 5n - 2. (2 marks)

08. i. By only using the compass and the straight edge with the scale cm/mm, construct the triangle ABC where AB = 7cm, $\hat{BAC} = 60^{\circ}$ and $\hat{ABC} = 30^{\circ}$ (3 marks)

ii. Construct the locus of points equidistant to the points A and B. (2 marks)

iii. Construct the locus of points equidistant to the points A and C. (2 marks)

iv. Name the intersection point of the above two lines as E. (1 mark)

v. Measure the length of AE and write it. (1 mark)

vi. Construct the circle with the centre E and the radius AE. (1 mark)

09. The following table is prepared based on the marks which were obtained by a group of students for a certain year end evaluation.

Class interval	No. of students (f)	Mid value (x)	fx
0 - 20	2	10	20
20 -40	8	.....	.....
40 - 60	12	.....	.....
60 - 80	15	.....	.....
80 -100	3	.....	.....
	$\Sigma f =$		$\Sigma fx =$

i. Copy the above table on to your answer sheet and complete it. (4 marks)

ii. According to the table, what is the modal class of the marks? (1 mark)

iii. Find the class interval which includes the median. (1 mark)

iv. Find the mean of the marks to the nearest whole number. (2 marks)

v. Find the percentage of children who scored more than 40 marks. (2 marks)

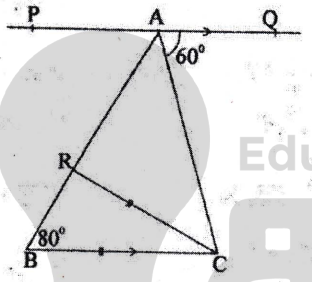
10. a. The distance between 2 cities on a map which is drawn to the scale 1:50 000 is 10cm. Find the actual distance between the two cities in kilometres. (4 marks)

b. A person in a tall building 60 m above the ground, observes the top and the bottom of another building which is 40m away from it. Next he measures the angles.
The angle of depression of the top is 30° and the angle of depression of the bottom is 56°.

i. Name one instrument that he used to measure the angles. (1 mark)

ii. By using a suitable scale, draw a scale diagram and find the height of the second building. (5 marks)

11. a. In the figure given below,
$BC // PQ$, $A\hat{B}C = 80^\circ$, $C\hat{A}Q = 60^\circ$ and $RC = CB$.



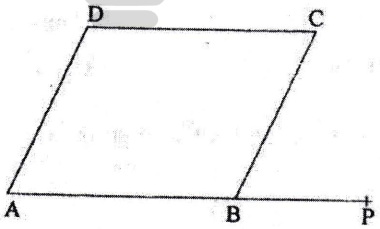
i. Find the magnitude of $B\hat{R}C$ (1 mark)

ii. Find $A\hat{C}B$. (2 marks)

iii. Show that AR = RC (3 marks)

b. If the lengths of diagonals of a rhombus are 12cm and 16cm, find the length of one side of it. (4 marks)

12.



The side AB of the parallelogram ABCD is produced to P. The angle bisector of $C\hat{B}P$ and the produced line of DC intersect at the point Q.
If $C\hat{A}B = Q\hat{B}P$

i. Copy the figure onto your answer sheet, mark the data given above. (2 marks)

ii. Show that ABQC is a parallelogram. (4 marks)

iii. Show that BC = CQ (2 marks)

iv. If the lines AQ and BC intersect at R,
Show that AB = 2RB (2 marks)