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சபரகமுவ மாகாண கல்வித் திணைக்களம்
Sabaragamuwa Provincial Department of Education

පළමු වාර පරීක්ෂණය 2018
முதலாம் தவணைப் பரீட்சை 2018
First Term Test 2018

11 ශ්‍රේණිය
தரம் 11
Grade 11

ගණිතය II
கணிதம் II
Mathematics II

පැය 3.00
இரண்டு 3.00
3.00 hrs

- ★ Answer ten questions selecting five questions from Part A and five questions from Part B.
- ★ Write down the relevant steps and the accurate units when answering the questions.
- ★ Each question carries 10 marks.
- ★ The volume of a right circular cone of radius r and height h is $\frac{1}{3}\pi r^2 h$ and the volume of a sphere of radius r is $\frac{4}{3}\pi r^3$

Part - A

Answer only 5 questions.

- (01) An incomplete table of values of x and y prepared to draw the graph of the function $y = 6 - 2x^2$ is shown below.

x	-3	-2	-1	0	1	2	3
y	-12	-2	4	4	-2	-12

- i) Find the value of y when $x = 0$
 - ii) Using the scale of 10 small divisions as one unit along the x - axis and 10 small divisions as two units along the y -axis, draw the graph of the above function.
 - iii) Write down the interval of values of x for which the value of y decreases positively.
 - iv) Write down the coordinates of the turning point of the function $y = x^2 - 3$
 - v) Write down the equation of the graph whose minimum value is -6 and which intersects the X - axis at the same points as that of the graph $y = 6 - 2x^2$
- (02) a) The annual rates percentage charged by a certain urban council for a house of assesses annual value of Rs. 50 000 is 7%. The owner of the house rents out his house for a year and he collects the rent monthly. From the annual income the rent monthly. From the annual income he receives, he spends 10% on the annual house maintenance. After paying the annual rates too, Rs. 109900 is left with him. Find the monthly rent of the house.

- b) A train which is travelling at uniform speed of 72 kmh^{-1} takes 12 seconds to pass a platform of length 100 m. If this train travels at a uniform speed of 54 kmh^{-1} , how long will it take for the train to pass the same platform?
- 03) a) A trader who bought 25 coconuts separates them to two heaps as small coconuts and big coconuts. He sells a small coconut for Rs. 75 each and a big coconut for Rs. 100 each. The total amount received by selling the coconuts is Rs. 2375. Taking the number of small coconuts as x and the number of big coconuts as y , construct a pair of simultaneous equations and find the number of small coconuts and the number of big coconuts separately by solving the equations.
- b) When twice a certain number is multiplied by the number obtained by subtracting 1 from the original number, the answer is 40. Construct a quadratic equation and find the two numbers by solving the quadratic equation.
- 04) i) Factorise : $x^2 - 5x + 6$
- ii) Make 'b' the subject of the formula $a = \frac{1-2x}{bx-y}$
- iii) Solve : $\frac{1}{x-1} - \frac{3}{x+3} = 0$
- iv) Using the knowledge of factors, find the value of $79^2 - 3 \times 79 - 4$
- 05) The slant height of a right circular solid cone is $7\sqrt{10}$ cm. The ratio of its perpendicular height to the base radius is 3 : 1.
- i) Find the base radius and the perpendicular height of the cone.
- ii) Calculate the volume of the cone.
- iii) A solid sphere is made out of the metal obtained by melting the above cone, without any wastage of metal. Show that the radius of the sphere is $7 \times 3\sqrt{\frac{3}{4}}$
- 06) The frequency distribution given below shows information about the number of one day matches that the cricket team of a certain sports club played and the scores collected.

Score	51-75	76-100	101-125	126-150	151-175	176-200
No. of matches	1	3	6	12	10	8

- i) What is the modal class?
- ii) Express the number of matches in which more than 150 scores were collected as a percentage of the total number of matches.

- iii) Calculate the mean score collected in a one day match taking the mid-value of the modal class as the assumed mean.
- iv) Find the total score that would be expected to be collected in 6 such one day matches they are scheduled to play in the coming days.

Part - B

(Answer five questions only)

- 07) The carpenter who constructs the roof of a certain house states that 70 tiles are required to tile the top row of one side of the roof and 13 tiles are required to tile the bottom row of the same side of the roof and the number of tiles in any row is 3 less than the number of tiles in the row below it. If it costs Rs. 35 for one tile, using the relevant formulae, find the total number of tiles required to tile one side of the roof and show that the total cost for the tiles required to tile one side of the roof is more than Rs. 29000.
- 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,
- Construct the triangle ABC such that $AB = 7$ cm, $\hat{BAC} = 60^\circ$ and $AC = 6$ cm.
 - Construct the trapezium $ABCD$ such that $CD = 3$ cm
 - Construct the bisector of BAC
 - Construct the circle which passes through points A and B , and whose centre lies on the bisector of the angle BAC .

- 09) The points A, B, C and D lie on the circle shown in the figure.

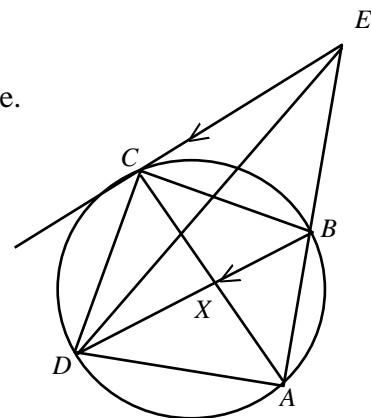
The side AB has been produced to E .

$$BD \parallel EC, \quad \hat{BAD} = \hat{ABC},$$

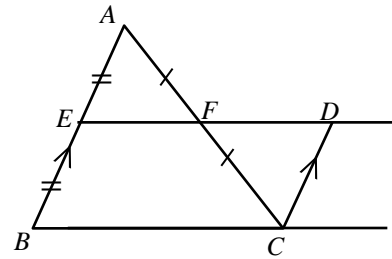
$$\hat{BAC} = 40^\circ, \quad \hat{ADB} = 70^\circ$$

The straight lines AC and BD intersect at X .

- Find the magnitude of CAD
- Prove that $\triangle ABC \cong \triangle ABD$
- Prove that the area of $\triangle AXD =$ the area of $\triangle BXE$
- Prove that the area of the $\triangle ADE =$ the area of the quadrilateral $ABCD$



- 10) In triangle ABC shown in the figure,
 $AB \parallel DC$, $AF = CF$, $AE = BE$.
 Show that $BCDE$ is a parallelogram
 and $EF = \frac{1}{2} BC$



- 11) i) Simplify : $\sqrt[4]{\frac{81}{16}} \times \sqrt{0.01} \times \left(\frac{2}{3}\right)^{-1}$
 ii) Find the value of x
 $2 \log_5 x + 4 \log_5 2 + \log_5 5 = \log_5 15 + \log_5 12$
 iii) Simplify $\frac{\sqrt{0.4562} \times 154.3}{(5.473)^2}$ using logarithms table.

- 12) The points P, Q, R and S lies on the circle with centre O . PQ is the diameter of the circle.
 $\widehat{PSO} = 50^\circ$ and $\widehat{PQR} = 65^\circ$. Giving reasons, find the magnitude of each angle given below.

- i) \widehat{PSO}
 ii) \widehat{SPO}
 iii) \widehat{PQS}
 iv) Show that RSQ is an isosceles triangle.

