Royal College - Colombo 07
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Grade 11 -Second Term Evaluation – July 2019
දෙවන වාර ඇගයීම – 2019 – ජූලි - 11 ශ්‍රේණිය

කාලය : පැය 2
Time: 2 hours

Mathematics – I
ගණිතය – I

| 32 | E | I |

Name /Index No : - ....

Certified Correct.

Signature of Invigilator

Important :

❖ This paper consists of 8 pages.

❖ Write your **Index Number** correctly in the appropriate places on this page and on page three.

❖ Answer all questions on this paper itself.

❖ Use the space provided under each question for working and writing the answer.

❖ It is necessary to indicate the relevant steps and the correct units in answering the questions.

❖ Marks will be awarded as follows.
Two marks each for questions 1 - 25 in part **A**.
Ten marks each for questions in part **B**.

❖ A blank paper can be obtained for rough work from the supervisor on your request.
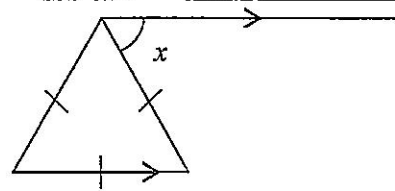
For Marking Examiner's use only

	Question Numbers	Marks
A	1 - 25	
B	1	
	2	
	3	
	4	
	5	
Total		

PART - A

1. 8 men can finish a certain work in 10 days. How many days will it take to complete the same work by 5 men?
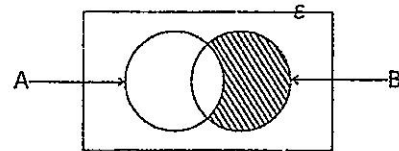
2. Simplify $\frac{1}{6x} + \frac{1}{2x}$

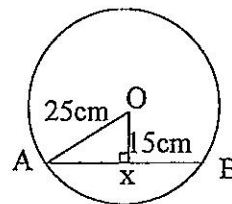3. Find the magnitude of x

4. If $\log_{10} 63.81 = 1.8049$, Write the value of 0.6381

5. Write the shaded portion in set notation.

6. A and B are two mutually exclusive events of a random experiment, If $P(A) = {}^1/_3$, $P(B) = {}^1/_5$, Find $P(A \cup B)$

7. In the given figure, O is the centre of the circle, AB is a chord. OA = 25cm, OX = 15cm. Find the length of AB?

8. Solve $1 - 3x > 10$ and write the maximum integer value that x can take?

9. Find the common ratio of the geometric progression. $\frac{1}{2}, \frac{1}{2^2}, \frac{1}{2^3}$

10. The given figure is a sketch of a vertical post AB which is erected on a horizontal plane BC and $B\widehat{A}C = 30°$. Find the angle of depression of C as seen from A
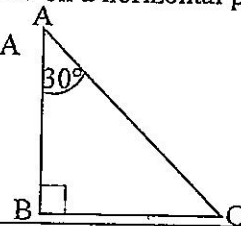

11. Find the L.C.M of $x(x+2), x^2, x(x+2)^2$

12. According to the given figure, ABCD is a parallelogram. E is the midpoint of DC. Mark (✓) infront of the correct statements and mark (✗) infront of the incorrect statements.

|	
$\triangle ABE = \triangle ADE + \triangle BCE$	
$\triangle ABE = \frac{1}{2}[\triangle ADC + \triangle BCE]$	
$\triangle ABE = \frac{1}{2} ABCD$	
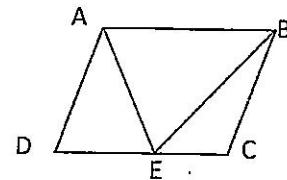
13. Rs. 40,000 will amount to a total of Rs. 49600 after 2 years at a certain annual simple interest rate. Find the annual simple interest rate.

14. In the given figure, ABC is a triangle, the mid points of BC and AC are P and Q respectively. If AN = QN, MN∥ PQ and MN = 4 cm, Find the length of AB
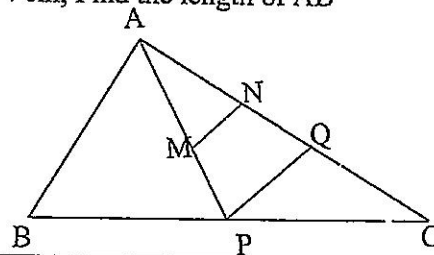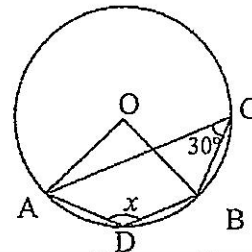
15. Factorize $a^2 + ab - a - b$.

16. A distance – time graph drawn by considering the motion of a car travelling at a uniform speed is shown in the figure, Find the speed of the car.
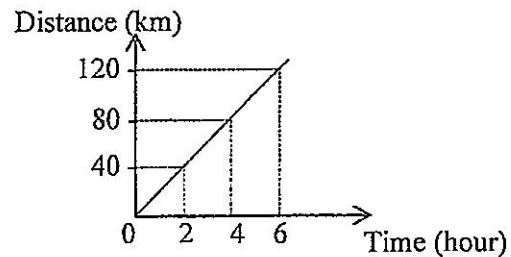
17. O is the centre of the circle. A, B, C and D are points on the circle. $A\hat{C}B = 30°$. Find the magnitude of x.

18. Make 'x' the subject of the formula $ax - b = cx$

19. The histogram given here shows the information about the marks of a group of students. Find the total number of students in this group.
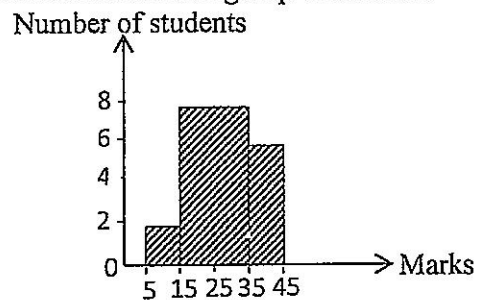
20. In the given figure, $A\hat{B}E = 90$, $B\hat{E}D = 90$ and AE and BD are two straight lines intersect each other at C

    i) Write the remaining condition that is necessary for the two triangle ABE and BDE to be congruent under the condition SAS.

    ii) Write two triangles other than ABE and BDE, which are equal in area?
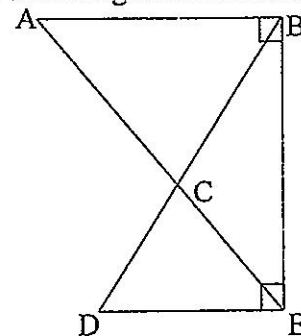
21. Write the equation of the straight line which passes through the points (0, 4) and (2, 8)

22. Solve $2x^2 = 8x$

23. Simplify $\sqrt{60} \times 3$

24. The cylinder and the cone give in the figure are of equal radius and equal height. If the total volume of both cone and the cylinder is 64 cm^3, Find the volume of the Cylinder?
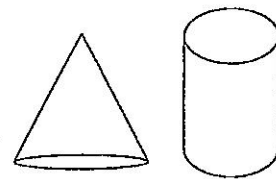
25. AB and BC are two straight lines. Show the appropriate construction by a rough sketch to identify the location of a point which is equidistance from two straight lines AB and BC, and 3 cm from BC.
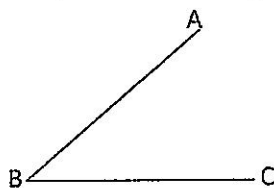
PART - B

01. A person gives $\frac{1}{3}$ of his wealth to his wife and $\frac{1}{3}$ of the remainder to his son.

   (i)   Find the remaining portion after giving to his wife as a fraction of the whole.

   (ii)   Find the portion given to his son as a fraction of the whole.

o   The remaining portion was equally divided among his three daughters.

   (iii)   Find the portion given to a daughter.

   (iv)   If the son gets 20,000/- more than a daughter, Find the amount obtained by a daughter.

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02. The figure shows a rectangular plot of land ABCD and a flower garden in the shape of a semi circle within the land.

A pond in the shape of quarter of a circle is built outside the land ABCD with the radius DE

AB = 28 m, BC = 7 m DE = EC   (Take $\pi = \frac{22}{7}$)

   (i)   Find the area of the pond?

   (ii)   Find the ratio between the area of the pond and the area of the flower garden.
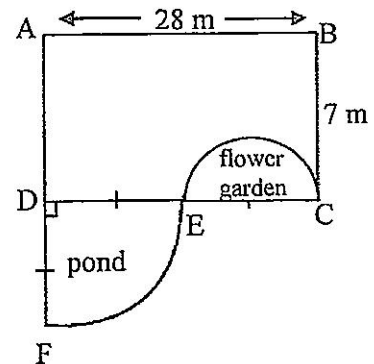
   (iii)   Find the area of the remaining portion of the land ABCD.

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(iv) It is required to make a parking plot in the shape of a right angled triangle which is $\frac{1}{4}$ the area of flower garden within the land ABCD in the remaining portion, illustrate by drawing on the given figure, a sketch of this with its measurement such that AD as one boundary and the other boundary is on AB.

03. Kumar obtains a loan of Rs. 120 000 from a financial institution at the rate of 12% simple interest per annum with the intention of settling the loan in 5 years..

  (i) Find the interest that has to be paid for one year?

  (ii) Find the total amount that has to be paid to settle the loan in 5 years.

  (iii) Kumar gives the loan money that he obtains from the financial institution with the intention of earning money, at 15% simple interest per annum as a loan to Nimal for that 5 years. Find the earning of Kumar from this transaction with Nimal?

  (iv) Find the rate at which Kumar should give the loan to Nimal in order that he earns the same amount in 3 years.

04. (a) To be eligible to get an admission for a course, it is required first to pass an entrance exam and then to face an interview.

The probability of a person who faces the entrance exam and passing it is $\frac{2}{5}$.

  (i) An incomplete tree diagram to represent the above information is given below, mark the relevant probabilities on the branches.

Entrance Exam
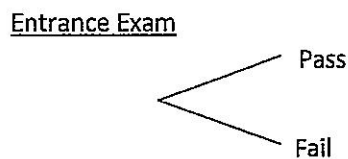
Pass

Fail

(ii) If the probability of a person who faces the interview and failing is $^1/_3$, extend the above tree diagram to represent the information of a person passing/ failing the interview and mark the relevant probabilities on it?

(iii) Find the probability of a person selected at random from those who faced both the entrance exam.and the interview being selected for the course.

(b) The sample space of submitting a project by Nimal and Kamal within the five days of a week is shown in the given diagram.
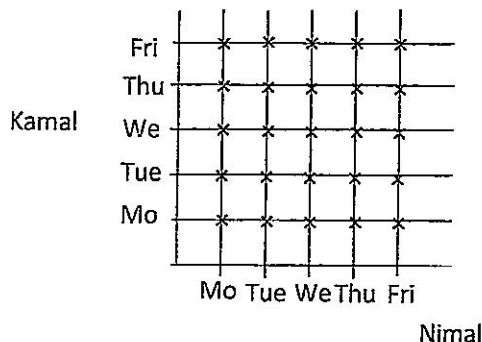
(i) Find the probability that both will be able to submit their reports on the same day.

(ii) Find the probability that Kamal will be able to submit his report on a day prior to the day on which Nimal submit his report?

05. The marks obtained by 30 students of a class for mathematics assignment is given below (out of 60)

56	31	36	27	24	43	41	29	38	12
15	34	48	36	26	23	17	49	39	46
32	47	45	37	32	37	28	42	57	55

(i) Write the range of the above data.

(ii) An incomplete frequency table including tally mark for the above data is given below, complete this table.

Class interval (marks)	Tally marks	Frequency	
10 – 20	///	3	
20 – 30	…….....	……....	
30 – 40	……...	……....	
40 – 50	……...	……....	
50 – 60	///	3	

(iii) Add cumulative frequency column to the above data and complete it?

(iv) Using the information in the table above, draw the cumulative frequency curve on the following co-ordinate plane.
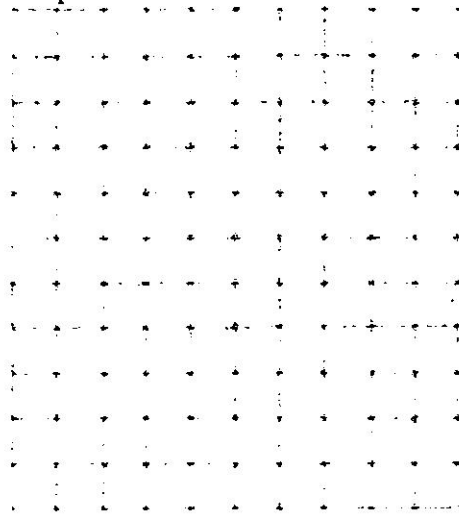
(v) Find the median marks according to the cumilative frequency curve.

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Grade 11 – Second Term Test – July 2019
දෙවන වාර පරීක්ෂණය - 2019 ජූලි - 11 ශ්‍රේණිය

කාලය : පැය 3
Time : 3 hours

Mathematics - II
ගණිතය - II

Name :- .... Grade : -................ Index number:- ....

Important:

o Answer ten questions selecting **five** questions from part A and **five** questions from part B.

o Each question carries ten marks.

o The volume of a cone of radius 'r' and height 'h' is given by $\frac{1}{3}\pi r^2 h$.

o The volume of a sphere of radius 'r' is given by $\frac{4}{3}\pi r^3$.

PART – A
Answer only five questions

1. An incomplete table consisting of values of the function $y = x^2 - 2x - 2$ corresponding to several given values of x is given below.

x	-2	-1	0	1	2	3	4
y	6	1	-2	....	-2	1	6

a) (i) Find the value of y when $x = 1$

   (ii) By selecting the suitable scale on both x axis and y axis, draw the graph of the function using the values given in the table.

b) Using the graph,

   (i) Write down how y changes as the variable x increases from -0.7 to 1

   (ii) If an approximate value of $\sqrt{2}$ can be obtained from the x co-ordinate of the point of intersection of the function $y = x^2 - 2x - 2$ and the straight line given by y= kx, find the value of k.

   (iii) Write down the equation of the function obtained by shifting the above graph by 1 unit vertically upwards towards the positive direction of y axis in the form of

   $y = (x \pm a)^2 \pm b^2$

2. A computer can be purchased outright at Rs. 23 000. It can also be purchased under the reducing balance of payment by making an initial payment of Rs. 5000 and the balance to be paid in equal monthly instalment of Rs. 1500 each. Number of months units is given by 8×15. Find the annual rate of interest.

3. a) A two digit given number is seven times the sum of its digits. The number formed by reversing the digits is 18 less than the given number. Taking that the digit in the tens place as x and the digit in the unit place as y of the given number.

    (i) Form a pair of simultaneous equation interms of x and y

    (ii) Find the given number.

  (b) Simplify $\dfrac{5x^2+70x-160}{x-2}$

4. The following table shows the information obtained during 30 days of a month, on the daily sale of a certain shop.

Sale (Rs)	101 - 150	151 - 200	201 - 250	251 - 300	301 - 350	351 - 400	401 - 450
Number of days	2	3	9	5	4	5	2

    (i) According to the given information, what is the modal class

    (ii) Calculate the mean income for a day by taking the mid value of the modal class as assumed mean to the nearest rupees?

    (iii) If the owner of the shop spends $^1/_3$ of his monthly sale for maintenance of the shop, show that the profit that he could expect in a month of 30 days does not exceed 6000/-

5. The length of the rectangle A is $x$cm and the length of the rectangle B is $(x+3)$ cm. The rectangle A and B each has an area of 21 cm^2

Given that the width of the rectangle A is 2 cm more than the width of the rectangle B, show that x is given by $2x^2 + 6x - 63 = 0$ and by solving it,

Find the length of the rectangle A to the nearest first decimal place? (Take $\sqrt{15} = 3.87$)

6. A person start to move from point A at a bearing of 045° and travel 40 km to reach the point B, from there he proceeds to travel at a bearing of 135°and travel 60km to reach the point C.

    (i) Draw a rough sketch to show the above information.

    (ii) Show that the length of AC is $20\sqrt{13}$

    (iii) Draw the scale diagram using the suitable scale.

    (iv) Using the scale diagram, find the value of $\sqrt{13}$ to the nearest first decimal place?

PART - B

Answer only five questions

7. a) The first row of a concert hall has 25 seats, and each row after the first row has 4 seats more than the row before it, and so on.

   (i)   Find the number of seats in the 10th row?

   (ii) Which row has 73 seats?

   (iii) Nimal says that "the total number of 15 rows are sufficient to accomadate 945 people at once, show that the above statement is incorrect.

   (b) Show that the sum of n terms of the progression 4, 8, 16, 32, ... is given by

   $S_n = 2^{n+2} - 4$

8. Using only a straight edge with cm/mm scale, and a pair of compasses and showing constructions lines clearly,

   (i)   Construct the triangle ABC such that BC = 10cm, AC = 8 cm and $A\widehat{C}B = 30°$

   (ii) Construct a line parallel to BC through A

   (iii) Construct the triangle BCD which is equal in area to the triangle ABC such that $C\widehat{B}A = A\widehat{B}D$

   (iv) Construct a perpendicular line to BC from D and mark the point it cuts CB produced at E

   (v)   Construct a circle taking D as centre and DE as radius.

9. A hemisphere of radius a cm is removed from another hemisphere of radius $2a$ cm and using the remaining metal, 28 small cones of radius r cm and height h cm is made without any wastage of metal. Show that $h = \dfrac{a^3}{2r^2}$

   Taking a = 2.36 cm, r = 0.6387 cm, Find the height h to the nearest cm using the logarithmic table.

10. (a) A group of 60 students were taken into survey, 35 students play football, 29 students play hockey and 3 students do not play either football or hockey.

   (i)   Show the above data in a venn diagram.

   (ii) Find the number of students who play only hockey.

   (iii) Find the number of students who play only one sports activity.

(b) It is later revealed that all the students who play hockey, play football and a student who play neither of the above two games mistakenly entered earlier in (a) above as he plays hockey.

   (i)   Include the correct information in a suitable venn diagram.

   (ii)   Find the number of students who play both football and hockey now?

11.   ABCD is a parallelogram. E is the mid point of AD, G is a point on BC such that EG is parallel to AB. F is a point on AB such that DF and CF intersect EG at X and Y respectively. Prove that $\Delta DXY = \frac{1}{8} ABCD$

12.   AB and CD are two equal chords of the circle with centre O. AC and BD intersect at X. AB produced and DC produced meet at E.

(copy the diagram in your answer script)
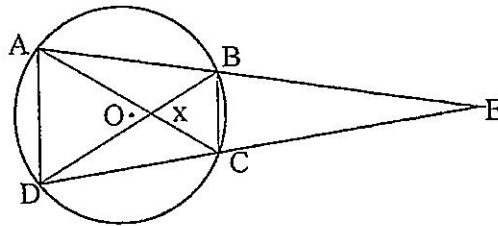
   (i)   Show that $\Delta ABX \equiv \Delta DCX$

   (ii)   Show that AD // BC

   (iii)   Show that ΔADE and ΔBCE are equiangular triangles.

   (iv)   Show that $\dfrac{BC}{AD} = \dfrac{AE-DC}{AE}$

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