Kegalle Educational Zone
Second Term Test - 2019

Grade 11

| Mathematics - I | 32 E I | Time : 2 Hours |

Name / Index No.: .... Class : ....

Part - I

- **Answer all the questions on this paper itself.**

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01) If $8.5^2 = 72.25$, $8.6^2 = 73.96$, $8.7^2 = 75.69$, find the first approximation of $\sqrt{74}$

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02) Based on the given information, name 2 parallelograms which are equal in area

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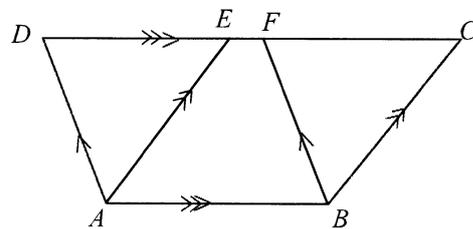
03) Find the factors : $2x^2 + 3x + 1$

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04) 10, 12, 14, 14, 15, 17, 18, 19, 20, 21, 22

The first quartile of the above data is 14 . Find its third quartile and inter quartile range.

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05) If the value of $A\hat{B}C = 42^0$, find the value of $A\hat{O}C$ reflex angle based on the given information.

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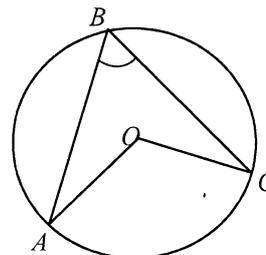
06) In the given figure, triangle ABC is drawn inside the semi-circle with radius 5 cm,. If the length of the side BC is 6cm, If the length of the side BC is 6 cm, find the length of AC.
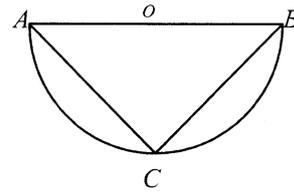
07) Write $5^3 = 125$ in logarithmic form.

08) Write the remaining pair of sides which needed to congruent the triangle ABC and ACD under the case of S.A.S
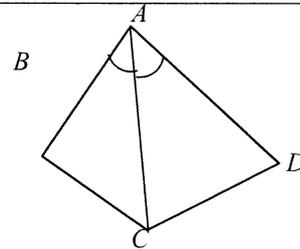
09) In the triangle *KLM, P, Q* and *R* are the mid points of the sides *KL*, *LM* and *KM* respectively. If The perimeter of the triangle *KLM* is 44 cm, find the perimeter of the triangle *PQR*.
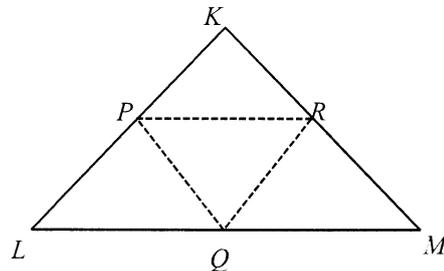
10) Simplify : $\dfrac{2}{x} + \dfrac{3}{2x}$

11) Based on the information given in the Venn diagram, write the shaded part as a set notation.
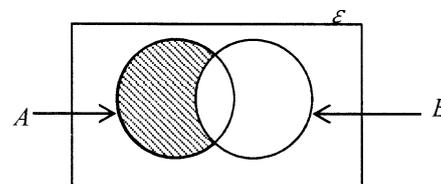
12) The volume of the right cylinder is 3080 cm^3. If its radius is 7cm, find the height of the cylinder.

13) Amal bought 500 shares in a company which pays annual dividends of Rs. 6 per share. Find his dividend income at the end of the year.

14) Based on the information given in the figure, find the value of p and q.
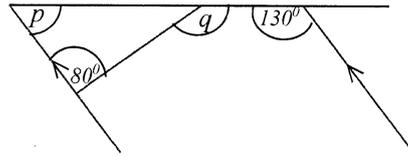
15) Find the gradient and the equation of the straight line which passes through the points (3,2) and (0, 4)
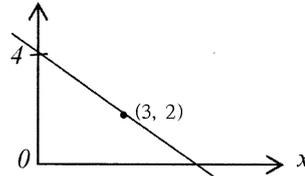
16) Simplify : $\frac{7}{3a} - \frac{1}{a} = \frac{4}{9}$

17) Based on the given information, find the values of unknown angles.
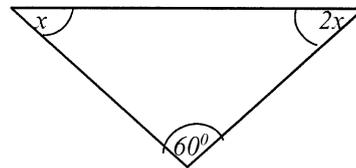
18) A cyclist takes 30 minutes to travel the distance of 25km. Find the speed of the cycle in kilometers per hour.

19) Write the 5th term of the geometric progression
$2x$, $4x^2$, $8x^3$, ...

20) A fair die numbered from 1 to 6 is rolled and an unbiased coin is tossed at the same time. Find the probability of getting tail on the coin and value greater than 4 on the die.

21) Solve the inequality $x - 2 \leq 3$ and write the smallest integral value that x can take.

22) The food is sufficient for 5 days for group of 6 hostellers. After 3 days, three of them went home. For how many days the remaining food is sufficient?

23) Based on the information given in the figure find the value of x.
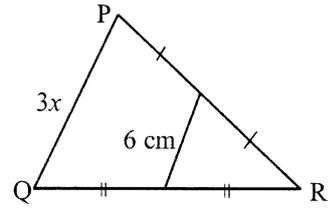
24) Find the L.C.M. of the terms

p^2q, $4pq^2$, $12pq$.

25) Two roads AB and BC join the points A, B and C which are not collinear. The water tank is to be fixed at the point "O" and it is equidistant to the roads and BC = BO. sketch, using your knowledge of loci, the place where the tank can ne fixed and name it as "O" on the arc CP
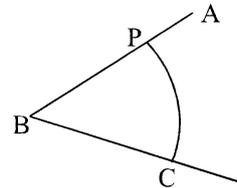
Part - B

- **Answer all the questions.**

01) On a certain day, $\frac{8}{11}$ of the tank was filled with oil. Everyday $\frac{1}{100}$ of the oil was wasted because of the evaporation and leakage.

   i)   Find the fraction of the remaining oil at the end of the first day.

   ii) What Fraction of the tank was remained at the end of the second day.

   iii) At the end of the second day, a certain amount of oil was removed from the tank. Then $\frac{3}{25}$ was remained. Find what fraction of the oil in the completely filled tank is removed.

   iv) If the removed amount of oil is 1482 ℓ , find the capacity of the tank in litres.

02) Figure shows the copper sheet which is used to make a memorial. It consists of 2 sectors of C and D centres with the radius 7 cm and the rectangular part with the length CD = 14 cm.
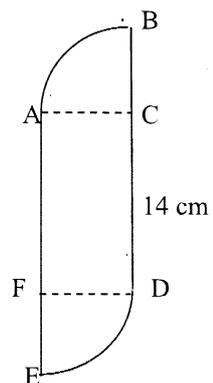
   i)   Find the perimeter of the copper sheet.

   ii) Find the area of the sheet.

iii) Find the minimum area of the rectangular sheet which can be used to cut the memorial.

iv) If the mass of $1 cm^2$ of the copper sheet is 1g, find the mass of the wasted part from the rectangular sheet with the maximum area in (iii) above.

03) a) From a survey conducted ·in a village 'Namalgama" revealed that 45 persons cultivate rubber, 30 persons cultivate tea and out of the persons who cultivate tea, 12 persons did not cultivate rubber.

   i) Represent the data in a Venn diagram.

   ii) Find the number of persons who cultivate only rubber.

   iii) If 3 persons do not cultivate either of the above crop, how many cultivators were surveyed?

   iv) Find the probability that the randomly selected person cultivate tea only.

   b) In the given Venn diagram
   i) Shade the region belongs to $B' \cap A$
   ii) Represent the relationship between A and B using set notations
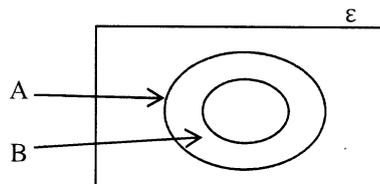
04) Customs duty of 35% is charged when a vehicle is imported.
   i) Find the customs duty that has to be paid for a vehicle worth Rs. 4 000 000.

   ii) If Rs. 400 000 charged for landing and transportation, find the total value of the vehicle.

   iii) If 15% is charged as VAT for all these expenses, find the value of VAT amount.

   iv) Express the tax amounts mentioned in (i) and (ii) above as a ratio and simplify it.

05) Given below is a grouped frequency distribution of the harvest gathered from the chilly cultivation of a farmer.

Class interval (kg)	Number of days.
8 - 16	8
16 - 20	....
20 - 24	......
24 - 28	4
28 - 40	......
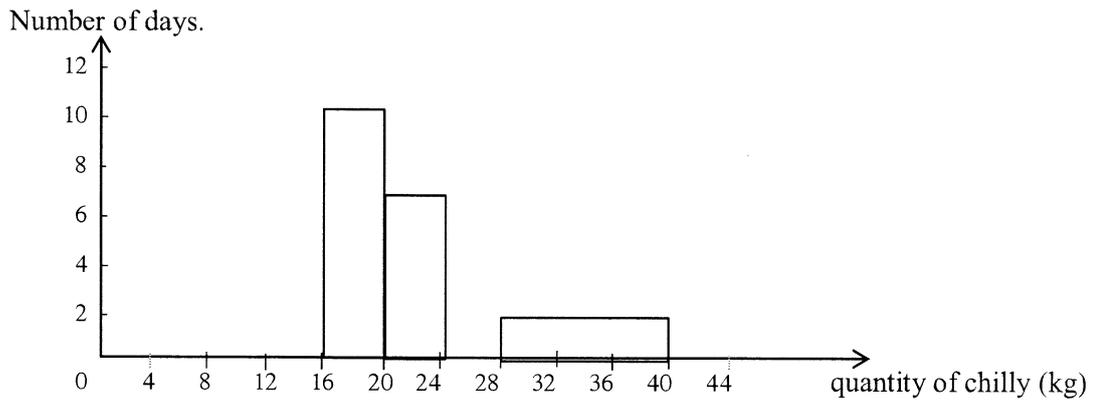
Number of days.

i)   Fill in the blanks in the table using the incomplete histogram.

ii) Complete the histogram using the frequency distribution.

iii) Draw the frequency polygon.

iv) Represent the number of days which gives more than 28 kg of chilly harvest out of the total no. of days as a percentage.

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Kegalle Educational Zone
Second Term Test - 2019

Grade 11

| Mathematics - II | 32 E II | Time : 3 Hours |

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

  The volume of the sphere of radius r is $\frac{4}{3}\pi r^3$ and the cone is $\frac{4}{3}\pi r^2 h$

Part - A

01) A computer priced at Rs. 78000 for outright purchase can be bought by making a down payment of Rs. 18000 and paying the rest in 10 equal monthly installments of Rs. 6495. If the interest on the loan is calculated. on the reducing loan balance. Find the annual interest rate.

02) An incomplete table prepared to draw the graph of the function $y = (x - 1)(x + 3)$ is given below.

x	-4	-3	-2	-1	0	1	2
y	5	0	-3	……	-3	0	5

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

   ii) Using the standard system of axes and a suitable scale, draw the graph of the function.

   iii) Using the graph,

        a)   Find the range of x for which $y \le 0$

        b)   Find the range of x which $(-2) > y \ge (-4)$

   iv) Represent the graph of $y = x$ on the above graph sheet.

   v)   Write the greatest root which satisfies the above two graphs.

03) a)   Simplify : $\frac{x^2+3}{b} \div \frac{6a+2ax^2}{3b}$

   b)   A cake is divided into three equal parts and an orange is divided into four equal parts. The total number of parts is 52. If the twice of the number of cakes is 9 more than the number of oranges. Find separately the number f cakes and oranges by constructing simultaneous equations.

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04) The total distance of the journey is 12 km. It takes 2 hours in total to travel $\frac{2}{3}$ of the journey at a uniform speed of (V+2) kmh^{-1}. Construct the quadratic equation in terms of V and hence find the value of V to the nearest first decimal place.   (take $\sqrt{3} = 1.73$)

05) Information regarding the speed and the number of vehicles travels during a certain period of time is shown in the following frequency distribution.

Speed (kmh^{-1})	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Number of vehicles	2	5	8	12	17	3	2	1

   i)   Find the mean speed of the vehicle to the nearest whole number by taking the mid value of the class interval 50-60 as the assumed mean

   ii) Find the time taken to travel 572 km using the above speed.

   iii) Officer in charge state that the maximum number of vehicles travels during this period does not less than 3100. Show that this statement is incorrect.

06)

B

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_____A

   AB is a vertical building of height 4m. The car "C" is observed with an angle of depression of 30^0 from B. At that moment, a bus travels towards the building, stopped 3m away from the car.

   i)   Represent the above information in a sketch.

   ii) Draw a scale diagram using the scale 1:100

   iii) Hence, find the value of the angle of elevation of the observer from the bus in the distance AD.

Part - B

07) First three terms of an arithmetic progression are (t + 2), (3t - 2), (3t + 2)

   i)   find the value of t.

   ii) Write first 3 terms.

   iii) Show that the sum of 20 terms from the third term is not greater than 1050.

08) i) Using only a straight edge and a pair of compasses, construct the quadrilateral *PQRS* such that, $PQ = 5.2$ cm, $Q\hat{P}S = 60^0$, $PS = 4.2$ cm, *PQ//SR and SR* = 7cm

    ii) Join SR and construct a line parallel to it through R and name the point of intersection of it and produced *PQ* as *T*.

    iii) Join *ST* and state the triangle which is equal in area to the triangle *STQ* and write the relevant theorem.

    iv) Hence show that the quadrilateral *PQRS* and triangle *PST* are equal in area.

09) a) A solid cone of radius $2r$ and the height is thrice of it is melted and 24 hem- spheres of radius 'a' are made without any wastage show that $a = \dfrac{r}{3\sqrt{2}}$

    b) If $r = 5.23$ cm, find the diameter of the hemi-sphere to the nearest first decimal place using the logarithmic tables.

10) a) In a farm there are four cows and 2 bulls. When the gate is opened once, it is noticed that the animal who came out is a cow or a bull and send it back and it is done again.
      i) Represent the sample space of the animals who came out in two situations in the grid.
      ii) Hence find the probability of   a) both being same type.

                                   b) first being cow

    b) If there are two cows and a bull in another farm, draw a tree diagram to show the above mentioned incident relevant to this farm.

11)
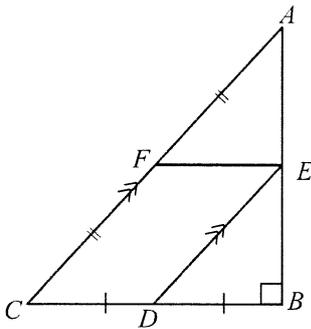
In the right angled triangle *ABC, D* and *F* are the mid points of the sides *CB* and *CA* respectively. If *CA // DE*, prove that,

i) $AE = EB$

ii) $FE = \dfrac{\sqrt{AC^2 - AB^2}}{2}$

iii) $A\hat{F}E + F\hat{A}E = E\hat{C}B + C\hat{E}B$

12)
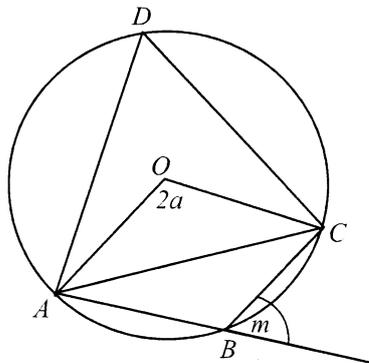
Using the circle with centre O, find the answers in terms of 'a' with reasons.

i) The value of $A\hat{D}C$

ii) The magnitude of the $A\hat{O}C$ reflex

iii) The magnitude of $A\hat{B}C$

iv) The value of '*m*'

v) *Using the interior angles of the quadrilateral ABCD, name a pair of supplementary angles.*

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