Divisional Education Office - Nallur, Jaffna
Second Term Examination - 2015

Grade: 10	Mathematics	Time: 3 Hours
	Name / Index No. :	

Part - I
Answer all questions.

01. If the price of 1kg dhal is Rs 160, what is the price of 500g of dhal.
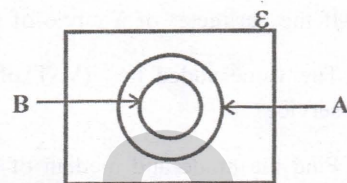
02. Add : $7.2 + 1.8$

03. Simplify : $2m + 5m - m$

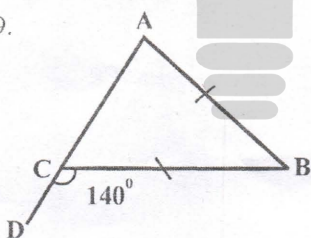04. Solve : $2x = 14$

05. Write 7_{ten} in base two

06. Give 2.4m in cm.

07. Shade the set $A \cap B$ in the given Venn diagram.

08. An item which was bought for Rs 100 was sold at a profit of 10%. What is its selling price.

09.

According to the data given in the diagram find the value of $B\hat{A}C$.

10. If $P = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$. A number is drawn from the set P. What is the probability that the number is a triangular number?

(1x10=10 Marks)

11. Find the LCM of $(2x^2 + 2x)$, $(x + 1)^2$

12. Simplify : $\dfrac{1}{x + 1} + \dfrac{2}{x}$
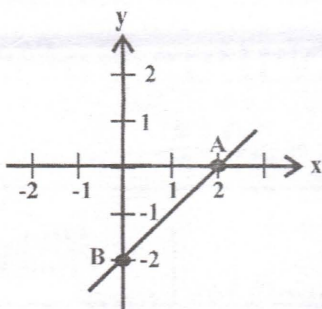
13. If $(x + p)^2 = x^2 + 8x + k$ find the value of p and k.

14. If $\log_3 x = -4$ find the value of x.

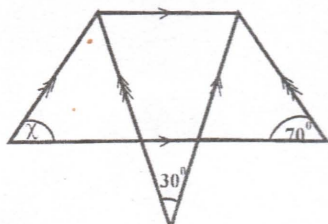15. $p = \sqrt{v + m}$ and $V = 16$, $m = 48$ find the value of p.

16. An injection solution is administered to a patient at a rate of $0.2 \, m/s^{-1}$ Calculate the time intakes for 240ml of injection solution to be administered.

01

17. In the given figure, find the gradient and equation of the straight line AB.

18. According to the data given in the diagram find the value of x.

19. 5 men need 8 days to complete a certain task. How many days would 2 men need to complete a task which is double the previous task.

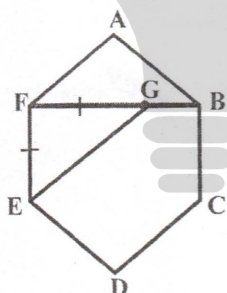20. Show that the factors of $\left(2x^2 - \frac{1}{2}\right)$ is $\frac{1}{2}(2x - 1)(2x + 1)$

21. If the perimeter of a circle of radius r is 8π, find the value of r.

22. The value added tax (VAT) of a certain service is Rs 500. If the rate of VAT is 8%, find the value of the service?

23. Find the mode and median of the given distribution.
    7, 9, 9, 10, 11, 12, 13, 14, 15

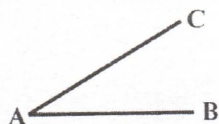24. In figure ABCDEF is a regular hexagon FG = FE, find the value of $G\hat{E}D$

25. If Rs 36,000 is divided between A and B in the ratio 5 : 7. What is the amount A received.

26. Make 'F' the subject in the formula $C = \frac{5}{9} F - 32$

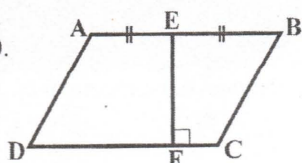27. Simplify and give the answer with positive index $\dfrac{2x^7}{x^{12}}$

28. Sketch with necessary constructions, how the location of the point P which is equidistance from the lines AB, AC and equidistance from the points A, B.

29. The length of a building in a map drawn to the scale 1 : 500 is 8cm find the actual length of the building in metre.

30. In figure, ABCD is a parallelogram. E is the mid point of AB. If AB = 12cm, EF = 8cm, find the length of BF.

(2 x 20 = 40 Marks)

02

01. a) Simplify : $\left(2\frac{1}{4} - \frac{1}{3}\right)$ of $\frac{2}{23}$

    b) Simplify : $\left(\frac{3}{7} - \frac{1}{14}\right) \div \frac{5}{28}$

    c) A person travels $\frac{1}{5}$ of his journey by foot, $\frac{1}{2}$ of the remaining by three wheeler and the rest by bus.
       i) What fraction of the whole journey remained after travelling by foot.
       ii) Write the distance travelled by three wheeler as the fraction of the whole journey.

       $(4 + 4 + 3 + 3 + 6 = 20 \text{ Marks})$

02. a) i) Evaluate : $\log_2 16 + \log_2 8 - 1$

       ii) If $10^{0.7884} = 6.143$ find the value of $\lg 614.3$

       iii) Solve : $\log_a x + \log_a 2 = \log_a 8$

       iv) If $\log_3 13 = p$, show that the value of $\log_3 39$ is $(p+1)$

    b) Simplify using logarithmic table $\dfrac{76.42 \times 11.82}{2.01}$

       $(3 + 3 + 3 + 3 + 8 = 20 \text{ Marks})$

03. a) An incomplete table to draw the graph of the function $y = 4 - x^2$ is given below.

 | x | −4 | −3 | −2 | −1 | 0 | 1 | 2 | 3 | 4 |
    |---|----|----|----|----|---|---|---|---|---|
    | y | −12 | −5 | .... | 3 | 4 | 3 | 0 | .... | .... |

    i) Complete the table.
    ii) Taking suitable scale, draw the graph of the function on graph sheet.
    iii) Write the Co-Ordinates of the turning point.
    iv) Write the equation of axis of symmetry.
    v) What is the range of value of x, when the function is increasing positively.
    vi) Write the max / min value.

    b) Without drawing the graph of the function $y = x^2 - 4$, deduce the followings.
       i) Write the equation of axis of symmetry.
       ii) Write the Co-ordinates of the turning point.
       iii) Write the man / min value.

       $(3 + 6 + 2 + 2 + 2 + 2 + 1 + 1 + 1 = 20 \text{ Marks})$

04. For a motor cycle of worth Rs 80,000 the custom duty charges is 10%, the VAT charges is 12% and also 10% profit marked by the dealer.
    i) What is the value of the motor cycle including custom duty?
    ii) What is the value of the motor cycle including VAT?
    iii) What is the profit dealer received?
    iv) What is the amount of money to be paid by a consumer to buy the motor cycle.
    v) How much more money he has to be paid to buy the motor cycle.
    vi) If he deposits that the money he has to buy the motor cycle in a bank which pays 8% annual simple interest. How much money he received at the end of 2 years.

       $(3 + 3 + 3 + 3 + 3 + 5 = 20 \text{ Marks})$

03

05. a)
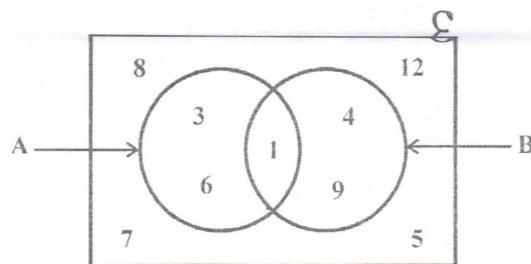
Answer the following questions using the Venn diagram given here.
i) Describe the set B in words.
ii) Write the set $A \cap B$ with list of elements.
iii) Write the set $A' \cap B$ with list of elements.
iv) Verify that $A' \cap B' = (A \cup B)'$

$(2 + 2 + 2 + 3 = 09$ Marks$)$

b) In a certain village, 23 farmers grow brinjal 13 grow only bitter gourd, the number of those who do not grow brinjal is 20 and the number of those who do not grow bitter gourd is 22.
i) Represent the above information in a Venn diagram.
ii) How many of the farmers grow neither of the two crops.
iii) How many of the farmers grow only brinjal.
iv) How many of the farmers grow exactly one of these crops.

$(4 + 2 + 2 + 3 = 11$ Marks$)$

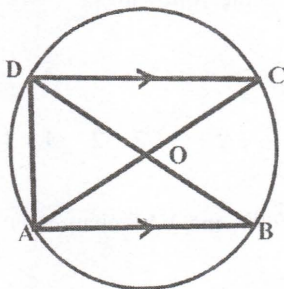06. a) In $\triangle ABC$, $AB = AC$ and bisector of the $\overset{\wedge}{BAC}$ meets BC at D.
i) Represent the above information on a diagram.
ii) Prove that $\overset{\wedge}{ABC} = \overset{\wedge}{ACB}$
iii) State the theorem releted to the above results.

b) i)
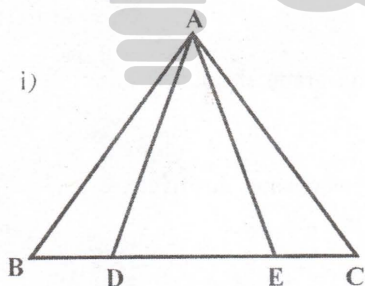
In figure $\overset{\wedge}{ABC} = \overset{\wedge}{ACB} = 50^0$ $\overset{\wedge}{BAD} = \overset{\wedge}{CAE} = 20^0$
Show that $\triangle ADE$ is an isosceles triangle.

ii)

In figure, O is the centre of the circle AC is a diameter. If $AB \parallel DC$ and $\overset{\wedge}{ACD} = 40^0$ find the value of $\overset{\wedge}{ADO}$.
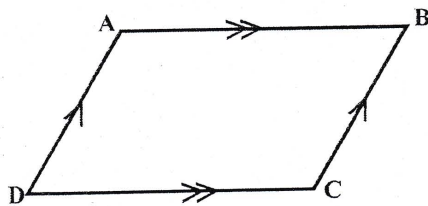
iii)
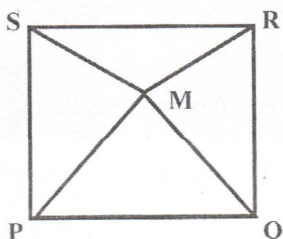
In figure, PQRS is square, $\triangle PMQ$ is an equilateral triangle. M is a point in the square.

1) Find the magnitude of $\overset{\wedge}{PSM}$?

2) Find the magnitude of $\overset{\wedge}{SMR}$?

$(9 + 3 + 3 + 5 = 20$ Marks$)$

04

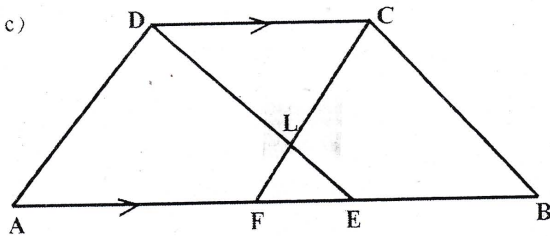07. a) Write three conditions a quadrilateral to be a parallelogram?

b)

In figure, ABCD is a parallelogram AB =12cm, $\stackrel{\wedge}{ADC} = 40^0$

i) Find the length of DC.

ii) Find the magnitude of $\stackrel{\wedge}{DAC}$?

c)

In figure ABCD is a trapezium. AD //FC and AE=FB. Prove that the followings.

i) AFCD is a parallelogram.

ii) ΔADE $\equiv$ ΔBCF

iii) EBCD is parallelogram.

iv) ΔELF is an isosceles triangle.

(4 + 3 + 5 + 4 = 12 Marks)

08. a) i) Factorize : $(2x - 1)^2 - 16$

ii) Factorize : $4k^2 + 4k - 3$

iii) If $a + b = 4$ and $ab = 2$ find the value of $a^2 + b^2$

b) i) Solve : $\dfrac{x}{x-2} - \dfrac{2}{2-x} = 3$

ii) Solve : $x^2 - 5x + 6 = 0$

iii) A person had Rs 5 stamps and Rs 10 stamps. If the total number of stamps is 7 and the total value of those stamps is Rs 50.
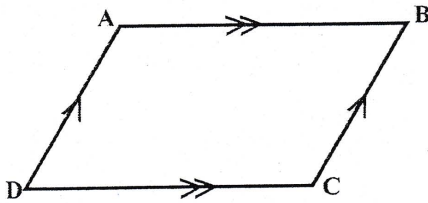
I) Taking the number of Rs 5 stamps as 'x' and the number of Rs 10 stamps as 'y'. Write a pair of simultaneous equation on x and y.

ii) By solving the above equations find the number of Rs 5 stamps and Rs 10 stamps separately.

(3 + 3 + 3 + 3 + 2 + 6 = 20 Marks)

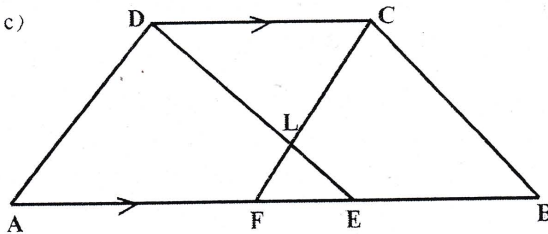07. a) Write three conditions a quadrilateral to be a parallelogram?

b)

In figure, ABCD is a parallelogram AB =12cm, $A\hat{D}C = 40^0$

i) Find the length of DC.

ii) Find the magnitude of $D\hat{A}C$?

c)

In figure ABCD is a trapezium. AD //FC and AE = FB. Prove that the followings.

i) AFCD is a parallelogram.

ii) $\triangle ADE \equiv \triangle BCF$

iii) EBCD is parallelogram.

iv) $\triangle ELF$ is an isosceles triangle.

(4 + 3 + 5 + 4 = 12 Marks)

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